UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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OCT 19 2017

Mr. Thomas Frick
Director
Division of Environmental Assessment and Restoration
Florida Department of Environmental Protection
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Dear Mr. Frick:

The U.S. Environmental Protection Agency has completed its review of Florida Department of Environmental Protection (FDEP) amendments to chapter 62-302 of the Florida Administrative Code (F.A.C.). These revisions, which FDEP transmitted to the EPA on May 22, 2015, with the necessary certification from FDEP General Counsel, codify into rule statewide estuary-specific numeric nutrient criteria.

As laid out in the enclosed decision document, *Decision Document of United States Environmental Protection Agency Determination Under Section 303(c) of the Clean Water Act Review of Amendments to Florida's Rule 62-302.532, F.A.C. Estuary Specific Numeric Interpretations of the Narrative Nutrient Criterion,* the EPA is approving the codification into rule estuary-specific numeric interpretations of Florida's narrative nutrient criteria.

In addition to the EPA's review pursuant to Section 303 of the Clean Water Act, Section 7(a)(2) of the Endangered Species Act (ESA), requires federal agencies, in consultation with the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS), to ensure that their actions are not likely to jeopardize the continued existence of federally listed species or result in the destruction or adverse modification of designated critical habitat of such species. The EPA received concurrence from the FWS Field Offices in letters dated February 14, 2017, and May 3, 2017. Additionally, the NMFS concluded formal consultation and provided a biological opinion in its letter dated August 16, 2017, which indicated that the EPA's approval action was not likely to jeopardize the continued existence of federally listed species or result in the destruction or adverse modification of designated critical habitat of such species. The EPA also wanted to highlight that NMFS concluded that the success of several of FDEP's management strategies, which have improved water quality over time, was an important consideration during their review. The EPA appreciates the State's management efforts and encourages the state continue its development of such strategies, where needed.

We would like to commend you and your staff for your continued efforts in environmental protection for the State of Florida. Further, we appreciate the efforts by your staff to provide additional documentation, as requested, throughout the EPA's review of the estuary-specific numeric interpretations. Should you have any questions regarding the EPA's approval action, please contact Ms. Lauren Petter of my staff at 404-562-9272.

Sincerely,

Mary S. Walker
Director
Water Protection Division

Enclosure

Decision Document of
United States Environmental Protection Agency Determination
Under Section 303(c) of the Clean Water Act
Review of Amendments to Florida's Rule 62-302.532, F.A.C.
Estuary Specific Numeric Interpretations of the Narrative Nutrient Criterion

INTRODUCTION

On May 22, 2015, Florida Department of Environmental Protection submitted new or revised water quality standards for review by the U.S. Environmental Protection Agency pursuant to Section 303(c) of the Clean Water Act (CWA or Act). This submittal establishes or codifies into rule, estuary-specific numeric interpretations of Florida's narrative nutrient criterion for the parameters total nitrogen (TN), total phosphorus (TP), and chlorophyll *a* (chl *a*) for all estuaries in the State of Florida. More specifically, this action establishes revised numeric nutrient criteria (NNC) as addressed in the technical support document for the following waterbodies: Big Bend from Alligator Harbor to the Suwannee Sound, Cedar Key, St. Marys River Estuary, Southern Indian River Lagoon, Mosquito Lagoon, several portions of the Intracoastal Waterway (ICWW) connecting estuarine systems, a variety of small gaps between estuaries with adopted NNC, and parameters for estuaries not currently covered by their adopted nutrient Total Maximum Daily Loads (TMDLs), including Upper Escambia Bay, Kings Bay, Lower St. Johns River, Indian River Lagoon, St. Lucie Estuary, and Caloosahatchee Estuary. In addition, numerous NNC values that were previously approved by the EPA, have been revised in this submittal because of the consideration of more recent water quality data. As described more fully below, where the EPA has determined that the amendments to chapter 62-302 of the Florida Administrative Code (F.A.C.) are themselves, new or revised water quality standards,[1] the EPA has reviewed and is approving today such water quality standards pursuant to Section 303(c) of the CWA.

Clean Water Act Requirements

Section 303 of the CWA, 33 U.S.C. Section 1313, requires states to establish water quality standards and to submit any new or revised standards to the EPA for review and approval or disapproval. The EPA's implementing regulations require states to adopt water quality criteria that protect the designated use. See 40 CFR Section 131.11(a). Such criteria must be based on a sound scientific rationale and must contain sufficient parameters or constituents to protect the designated use. Id. For waters with multiple use designations, the criteria shall support the most sensitive use. Id. In addition, the EPA's regulations require that in establishing criteria, a state shall consider water quality standards of downstream waters and shall ensure that its water quality standards provide for the attainment and maintenance of water quality standards of downstream waters. See 40 CFR Section 131.10(b).

A state's submission of water quality criteria must include (1) the methods used and analyses conducted to support water quality standards revisions, (2) water quality criteria sufficient to protect the designated uses and (3) a certification by the State Attorney General or other appropriate legal authority within the state that the water quality standards were duly adopted pursuant to state law. See 40 CFR Section 131.6.

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[1] EPA has provided FAQs on "What is a New or Revised Water Quality Standard Under CWA 303(c)(3)?" at http://water.epa.gov/scitech/swguidance/standards/cwa303faq.cfm. The link provides detailed information of such analysis.

Endangered Species Act Requirements

In addition to the EPA's review pursuant to Section 303 of the CWA, Section 7(a)(2) of the Endangered Species Act (ESA) requires federal agencies, in consultation with the Fish and Wildlife Service (FWS) and/or the National Marine Fisheries Service (NMFS), to ensure that their actions are not likely to jeopardize the continued existence of federally listed species or result in the destruction or adverse modification of designated critical habitat of such species.

With regard to ESA Section 7 consultation activities for this 303(c) action, the EPA reinitiated consultation on December 9, 2016, with the FWS and incorporated by reference the consultation materials associated with the EPA's approval of the original NNC, pursuant to 50 CFR Section 402.12(g). This provision allows a Federal agency to fulfill the biological evaluation (BE) requirement for a new proposed action by incorporating by reference earlier BE(s) if the proposed action is identical, or very similar to a previous action. The EPA determined that slight revisions to estuary-specific NNC authorized in this Section 303(c) action, continued to be "may affect, but not likely to adversely affect," when compared to the original NNC values on which the FWS had already concurred, and in some instances revisions were considered to be no effect. This is because, no additional exposure pathways were added by the updated NNC and the EPA concluded that either no change or a small amount of change occurred to the criteria values. The EPA therefore, relied on the following historical FWS BEs and concurrences:

303(c) Action and Summary of Types of Actions Taken	Date of BE	Date(s) of Concurrence/ESA Conclusion from Service(s)
Florida NNC Rule language – Inland Waters and Some Specific Estuary NNC	12/20/12	FWS All Field Offices - 7/31/13 NMFS 8/2/16
Florida Estuary NNC (Governor's Report, Panhandle, and 2013 Estuaries)	10/25/13	FWS Jacksonville and Vero Beach Field Offices 2/3/14 FWS Panama City Field Office 11/19/13 NMFS 8/2/16
H1 NNC site specific action; combined BE for: -Lower St Johns River -Portions of Indian River Lagoon (IRL) (Banana River Lagoon, Central IRL, and North IRL)	8/14/13	FWS Vero Beach Field Office 11/15/13 (for IRL) FWS Jacksonville Field Office 12/16/14 (for St. Johns)
H1 NNC site specific action: -Caloosahatchee Est. Tidal Seg.1, 2, 3 -St. Lucie and South Fork St. Lucie Estuary, North and South Fork St. Lucie River, -Central IRL	8/14/13	FWS Vero Beach Field Office-11/15/13
Fenholloway NNC through a Water Quality Based Effluent Limit (WQBEL)	2/20/14	FWS Jacksonville Field Office - 4/4/14
Tidal Peace River NNC	10/18/13	FWS All Field Offices - 3/5/14

The FWS replied to the EPA's December 9, 2016, re-initiation request on December 21, 2016. In the December 21, 2016 letter, the FWS requested additional information, as well as the separation of the

request by individual field office. In three letters dated February 8, 2017, the EPA submitted re-initiation requests to the three field offices.

The EPA reinitiated consultation on February 3, 2017, with the NMFS and incorporated by reference the consultation materials associated with the EPA's approval of the original NNC, pursuant to 50 CFR Section 402.12(g). The EPA determined that slight revisions to estuary-specific NNC authorized in this Section 303(c) action, continued to be "may affect, but not likely to adversely affect," when compared to the original NNC values which NMFS addressed in a Biological Opinion dated August 2, 2016, which concluded formal consultation on the EPA's action. The EPA's determination is based on the fact that no additional exposure pathways were added by the updated NNC, the EPA concluded that either no change or a small amount of change occurred to the criteria values, and in some instances revisions were considered to be no effect. The EPA therefore, relied on the following historical NMFS BEs, supplemental BE materials, and information contained in the NMFS BO dated August 2, 2016.

303(c) Action and Summary of Types of Actions Taken	Date of BE	Date of ESA Conclusion
FL NNC Rule language – Inland Waters and Some Specific Estuary NNC	12/20/12	8/2/16
FL Estuary NNC (Governor's Report, Panhandle, and 2013 Estuaries)	10/25/13	8/2/16
H1 NNC site specific action: combined BE for lower St Johns River and portions of Indian River Lagoon (Banana River Lagoon, Central IRL, and North IRL)	8/14/13	8/2/16
H1 NNC site specific action: Caloosahatchee Est. Tidal Seg.1, 2, 3, St. Lucie and South Fork St. Lucie Estuary, North and South Fork St. Lucie River, IRL- Central	8/14/13	8/2/16
Triennial Review – including Tidal Peace River NNC	5/7/14	8/2/16
BE Supplement – Addressing Three Larger Scale Nutrient Revisions	8/21/15	8/2/16
Fenholloway NNC through a WQBEL	2/20/14	8/16/17

The EPA received concurrence from the Panama City FWS Field Office and a combined concurrence response from the North and South Florida FWS Field Offices in letters dated February 14, 2017, and May 3, 2017, respectively. In a letter dated August 16, 2017, NMFS concluded formal consultation and provided a biological opinion which concluded that the EPA's approval is not likely to jeopardize any ESA-listed species and is not likely to destroy or adversely modify designated critical habitat under NMFS' jurisdiction. While no reasonable and prudent measures were identified in this current consultation effort, the review completed by NMFS indicated that the success of several historical management strategies were an important consideration during the Service's consultation. Therefore, the EPA encourages the state to continue its development of a Reasonable Assurance Plan (RAP) for the Southwest Fork of the Loxahatchee River and move forward with its implementation once complete.

Florida's New and Revised Water Quality Standards Submission

The amendments to Section 62-302.532, F.A.C., were considered and approved for adoption by the Florida Environmental Regulation Commission (ERC) at a public hearing held on November 19, 2014. The proposed rule was challenged in December 2014; however, the challenge is now settled and the rule took effect on June 7, 2015. The water quality standard (WQS) revisions addressed in this decision were submitted to the EPA by letter dated May 22, 2015, from Craig D. Varn, General Counsel for FDEP, to Heather McTeer Toney, Regional Administrator of the EPA's Region 4 Office. As required by the

CWA, the aforementioned letter included certification by the General Counsel that the new or revised WQS revisions set out in Section 62-302.532 were duly adopted pursuant to existing Florida law. This submittal includes site specific interpretations of the narrative nutrient criteria for estuaries addressed in the August 1, 2013, Report to the Governor and Legislature (Governor's Report) that was required by chapter 2013-71, Laws of Florida. That statute also required FDEP to adopt NNC for those same estuaries by rule or final order by December 1, 2014. Additionally, the Governor's Report also included numeric interpretations of the narrative nutrient criteria through TMDLs for the following estuaries: Upper Escambia Bay, Lower St. Johns River, Indian River Lagoon, St. Lucie, and the Caloosahatchee. In cases where the TMDL only addressed one causal parameter (TN or TP), the Governor's Report provided the NNC for the other causal parameter and chl *a*. This submittal adopts the numeric interpretations for those other causal parameters and chl *a* into rule.

BACKGROUND/HISTORY

On November 30, 2012, the EPA approved amendments to FDEP's water quality standards, set out in chapters 62-302 and 62-303, F.A.C., that established NNC for lakes, springs and flowing waters, as well as several estuaries (Tampa Bay, Sarasota Bay, Charlotte Harbor, and Clearwater Harbor/St. Joseph South) and marine waters of South Florida. The revisions also established procedures for developing NNC that interpret the narrative nutrient criterion at 62-302.530(47)(b).

On November 30, 2012, in order to comply with the requirements of the Consent Decree in *Florida Wildlife Federation v. Jackson,* No. 4:08cv324 (N.D. Fla.), the EPA proposed NNC for Class I and/or III inland flowing waters where coverage was uncertain under FDEP's nutrient rules, as well as numeric downstream protection values (DPVs) for unimpaired lakes. The EPA also proposed NNC for those Florida estuarine and coastal waters not covered by FDEP's nutrient rules, as well as numeric DPVs for estuaries and South Florida marine waters. The EPA had previously promulgated NNC for lakes and springs in Florida, as well as numeric DPVs for impaired lakes.

The EPA and FDEP then worked together to develop an Agreement in Principle, dated March 14, 2013, that included FDEP's commitment to submit, by August 1, 2013, NNC for the remaining estuarine and coastal waters not covered by the existing FDEP nutrient rules. To cover the remaining estuaries and coastal waters, FDEP submitted three water quality criteria documents, two dated July 31, 2013, and one dated August 1, 2013, that established site specific estuary criteria under Hierarchy 1 of FDEP's current NNC rule. The EPA approved the site specific estuary criteria on September 26, 2013. These submittals completed the actions FDEP committed to undertake to have state NNC in place for all Florida fresh water lakes, springs, estuaries and coastal waters, and the majority of flowing waters in the state.

Following the EPA 303(c) approval actions for FDEP's NNC submittals that took place in 2012 and 2013, CWA effective NNC for all fresh water lakes, springs, estuaries and coastal waters, and the majority of flowing waters, were in place in the state. Following these actions, the EPA withdrew or ceased its federal rulemaking efforts in September 2014.

More specifically, regarding the history of Section 62-302.532 titled Estuary-Specific Numeric Interpretations of the Narrative Nutrient Criterion, this section was first added to the Florida Administrative Code as part of the State's nutrient rule, which was adopted by the ERC on December 8, 2011, and approved by the EPA on November 30, 2012. At that time Section 62-302.532 included NNC for nine estuary areas including: Tampa Bay, Clearwater Harbor, Sarasota Bay, Charlotte Harbor, Clam Bay and South Florida marine waters (Tidal Cocohatchee River/Ten Thousand Islands, Florida Bay, the

Florida Keys, and Biscayne Bay) that were addressed in three subsections: (1) a table of estuary-specific values, which the EPA considers to be NNC, for TN, TP, and chl *a* to serve as numeric interpretations of paragraph 62-302.530(47)(b) of the State's existing narrative criteria for nutrients, (2) reference to maps showing the specific spatial application of those criteria values, and (3) a general schedule for future planned adoptions.

The EPA then received two amendments to rule 62-302.532 dated July 31, 2013, one that included NNC for an additional six estuary areas (Perdido Bay, Pensacola Bay, Choctawhatchee Bay, St. Andrew Bay, St. Joseph Bay, and Apalachicola Bay) titled "Numeric Nutrient Criteria for Florida's Panhandle Estuaries" and another that included NNC for seven additional estuary areas (Loxahatchee River Estuary, Lake Worth Lagoon, Halifax River Estuary, Guana River/Tolomato River/Matanzas River (GTM) Estuary, Nassau River Estuary, Suwannee, Waccasassa, and Withlacoochee River Estuaries, Springs Coast (Crystal River to Anclote River)) titled "Numeric Nutrient Criteria for 2013 Florida Estuaries." For both submittals, the State subdivided each system into segments and then used a common overall approach to develop criteria for TN, TP, and chl *a*. The resulting criteria for each estuary system were then added to the existing table in subsection 62-302.532(1). In addition, for the 2013 Florida Estuaries submittal, a different methodology was used for the near coastal waters with the resulting criteria for near coastal waters set out in a new subsection number 62-302.532(2). The EPA approved both submittals on September 26, 2013. More detail on the approval rationale can be found in the decision documents for these respective approvals.

Lastly, the EPA received a submittal dated August 1, 2013, which contained FDEP's Governor's Report, as required by the terms of chapter 2013-71, Laws of Florida. The Governor's Report established the water quality standards for certain estuarine and coastal waters as the current conditions of those unimpaired waters until FDEP established a numeric interpretation of the narrative water quality criterion for nutrients by rule or final order. Pursuant to Section 303(c) of the CWA, the EPA approved those provisions of the Governor's Report that it determined were new or revised water quality standards. Since the Governor's Report largely established placeholder NNC for various estuaries, the State has now, by this submittal, established by rule or final order the NNC for those estuaries.

TECHNICAL APPROACHES FOR NNC DEVELOPMENT

Because of the diversity of Florida's marine estuary systems, FDEP used "estuary specific" approaches to develop NNC. All existing information for each estuary was synthesized, and the NNC were based on the ecological endpoints most relevant for any particular estuary. At a minimum, all NNC will support the Class III designated use of "recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife." These NNC interpret the longstanding narrative nutrient criterion to protect aquatic life which provides that "[i]n no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora or fauna." Rule 62-302.530(47)(b), F.A.C.

The main method FDEP used to develop the NNC is the reference period approach, which identifies the times and areas where an estuarine segment is healthy and well-balanced. Water quality data from the identified reference period of time are used to establish NNC that will maintain a healthy aquatic community and protect the designated use. For a few estuaries, where there were limited data available, FDEP used the reference waters approach, which identified a similar, nearby healthy and well-balanced estuary with sufficient water quality data and established the NNC based on the reference waterbody. As stated above, the Governor's Report included numeric interpretations of the narrative nutrient criterion

for some estuaries with nutrient TMDLs including Upper Escambia Bay, Lower St. Johns River, Indian River Lagoon, St. Lucie Estuary, and the Caloosahatchee Estuary. In cases where the TMDL only addressed one causal parameter, the Governor's Report provided numeric nutrient criteria for the other nutrient parameter and chl *a*. The EPA approved Governor's Report values, or Governor's Report values that have been updated with more recent water quality data, have now been adopted by rule as NNC for those estuaries. Where the bases for those NNC are the same as the bases for the values contained in the Governor's Report, the EPA will continue to rely on its September 26, 2013, approval document that outlined the technical rationale and defensibility for those NNC.

The following estuaries were addressed in this submittal using the reference period approach, which is described in more detail below: Big Bend from Alligator Harbor to the Suwannee Sound, Cedar Key, St. Marys, Southern Indian River Lagoon, Mosquito Lagoon, and several portions of the Intracoastal Waterway connecting estuarine systems, and a variety of small gaps.

Reference Period Approach

FDEP identified years when any given estuary maintained a well-balanced, natural population of flora and fauna, and established NNC at levels that preserved the data distribution of the healthy conditions, taking into account the measured natural variability of the water quality for any given estuary. This approach ensures that nutrients are maintained in a manner that will provide for the same level of use support protection documented during health conditions. FDEP used the following steps to develop the NNC for each estuary contained in this submittal:

1. Compiled available water quality data including TN, TP, chl *a*, dissolved oxygen (DO), and Secchi depth (SD).
2. Conducted quality assurance evaluations and data screening for all data.
3. Established estuarine segmentation based on relative homogeneity (e.g., salinity, hydrology, system morphology, etc.)
4. Removed any areas/Waterbody IDs (WBIDs) that were listed as impaired on Florida's 303(d) list.
5. Calculated biological endpoints (e.g., chl *a*, DO, water clarity) which if achieved would indicate that the designated use during a particular period was being protected.
6. Evaluated the achievement of biological endpoints using the screened data and established a period during which the reference period approach was appropriate.
7. Conducted statistical analyses, of the TN, TP, and chl *a* data associated with the reference period approach and established criteria for TN, TP, and chl *a*.

Regarding datasets and data screening for calculating the NNC, FDEP used the TN, TP, and chl *a* data from the Impaired Waters Rule (IWR) Run 49 database and some additional datasets including data in Florida's STORET. STORET data were combined with the IWR Run 49 data to ensure that data records for each estuary extended through the end of 2013. The combined data set was used for the current criteria development effort because it represents the most complete and up to date data set for the estuaries under consideration for NNC development. Therefore, in many cases the revised data set provided additional data that were not previously available when the same estuaries were evaluated for the Governor's Report dated August 1, 2013. Use of the updated data resulted in most of the NNC previously approved by the EPA on September 26, 2013, being revised. However, for the most part, those revisions did not result in significant changes to the NNC magnitude.

In compiling the revised data set, FDEP excluded data with fatal qualifier codes including: a value based on field kit determination but results may not be accurate; estimated value; off scale low; presumptive evidence of presence of material; sampled but analysis lost or not performed; sample held beyond the accepted holding time; lab analysis was from an improperly preserved sample; and data rejected and should not be used. FDEP used one half of the report method detection limit for data with values less than the laboratory method detection limit or that indicated a compound was analyzed for, but not detected. Data that were flagged in the IWR database as not usable for Verified List purposes were also excluded from NNC calculations and/or target evaluations. FDEP used corrected chl *a* data if available or applied a correction factor to the uncorrected chl *a* data if corrected data were not available.

In reference to step 4 above, before screening estuarine segments against the biological endpoints for the reference period, FDEP reviewed the 303(d) listing status for all WBID assessment units, the current federally approved 303(d) list of impaired waters and all subsequent listing or delisting actions taken by FDEP according to the IWR. FDEP determined that the reference period approach was valid for developing NNC for some estuarine systems that were previously included on the 303(d) list of impaired waterbody, but have been delisted or are currently listed as impaired and actually meet their designated uses based on recently revised and approved criteria and/or new assessment methodologies. FDEP plans to delist waters that were listed for DO but were determined to meet the recently revised marine DO criterion, listed for DO but were determined to be naturally low in DO, and/or were listed based on levels of chl *a* exceeding historic levels that did not also demonstrate a statistically significant increasing trend in chlorophyll.

FDEP also included or excluded years of data from statistical analyses for a given estuary based on the following decision criteria:

1. For WBIDs on the 1998 303(d) list for nutrients that were delisted to Category 3b because available data were insufficient to assess whether designated uses were being protected, FDEP calculated the annual geometric mean (AGM) for chl *a* for all years prior to 1998. If the AGM was less than 11 µg/l for a given year, the data from those years were included. If the AGM was greater than 11 µg/l, FDEP excluded data from that year and the preceding year in the criteria calculation as a conservative measure to ensure that previous nutrient conditions did not contribute to the observed elevated chl *a* levels.
2. For WBIDs listed as impaired for nutrients based on a mean chl *a* greater than 11 µg/l under the IWR assessment methodology that were later removed from the 303(d) list, FDEP excluded any year and the preceding year for which the WBID exceeded 11 µg/l chl *a*.
3. For WBIDs listed as impaired for nutrients based on an increase in chl *a* of 50% over historical levels under the then-applicable IWR assessment methodology, FDEP conducted a Mann's one-sided, upper-tail test for chl *a* trend over the period of record. If no increasing trend was found, then all years were included in the criteria calculations. If an increased trend was found, then the years in which the chl *a* values were significantly increasing were excluded from criteria calculations. The use of the Mann's one-sided, upper-tail test is considered a more robust test than relying on a simple increase over historical levels of chl *a*. FDEP adopted the Mann's test in December 2011 and the EPA approved that provision in 2012.
4. FDEP determined whether WBIDs on the 303(d) list for DO for any listing cycle including 1998 would meet the newly revised and the EPA approved marine DO saturation criterion mentioned above. Data were included for any given assessment cycle if it met the marine DO criterion and they were not included if it did not meet the revised marine DO criterion. Data

were not included in NNC calculations if the DO saturation criterion were not met. For 1998 listings, FDEP assessed the impairment status under the revised marine DO criterion following provisions in the IWR for daily DO assessments, for the following eight year periods as applicable: 1973-80, 1981-1988, and 1989-1996. If any value at a given site and time was less than 2 mg/l, then the 25th percentile of all values measured at that site and time were used as the site and time value. Results obtained for a single day were averaged for the assessment.

Regarding the evaluation of biological endpoints listed in step 5, FDEP considered specific biological endpoints that indicated an estuarine segment was meeting its designated use during a particular period of time that would then represent reference conditions. As discussed below, the endpoints included transparency where the following were available: the targets of seagrass and water clarity, chl *a* indicating a lack of algal blooms, and the DO concentration and/or percent saturation value(s). These three endpoints are adequately sensitive indicators of nutrient enrichment, indicative of the health of the system as a whole, and representative of conditions that protect aquatic life and recreation uses. In addition, the EPA Science Advisory Board also recommended these endpoints be used for the 2012 NNC proposal for Florida's estuarine waters.

Seagrasses

Healthy populations of seagrasses serve as widely recognized indicators of biological integrity in estuarine systems and, in turn, of balanced natural populations of aquatic flora and fauna. Whether waters are maintaining seagrasses can be measured by water clarity, as clarity relates to light levels sufficient to maintain historic depth of seagrass colonization. FDEP determined that when an average value of 20% of the sunlight that strikes the water's surface (incident light) reaches the bottom of the water column (to the depth of seagrass colonization), sufficient light is available to maintain seagrasses. FDEP determined that ensuring 20% of incident light at the surface reaches the bottom of the water column would also support the reference depth of colonization. Therefore, where both coverage information for historic or recent seagrass presence was available and a depth of seagrass target could be determined,[2] water clarity (Kd) targets based on SD measurements were required to achieve 20% of surface light at the mean depth of the deep edge of seagrass beds relative to mean sea level.

FDEP assessed whether 20% light was present at the depth targets for estuaries each year by comparing annual average SD results with the SD target to identify the years that water clarity supported seagrass depth targets. FDEP calculated the annual average SD as the arithmetic mean of daily segment means (daily segment mean is the mean of all measurements taken from stations within the segment on a given day) per year. FDEP then calculated the upper 90% confidence interval of the mean in a statistically valid manner as outlined in the technical support document (TSD) for this submittal titled "Numeric Nutrient Criteria for Estuaries Addressed in the August 1, 2013, Report to the Governor and Legislature," January 30, 2015. For segments that lacked seagrass colonization depth targets, FDEP assessed whether 20% light was present at the deepest depths of those segments. FDEP consulted seagrass coverage maps from those segments and concluded that if stable seagrass beds were present at the deepest points, then 20% light was present and the water clarity endpoint was met. To determine whether current conditions in a given estuary met the DO endpoint, FDEP looked at whether DO levels were attaining the state DO water quality criterion recently revised by FDEP and approved by the EPA

[2] Seagrass does not naturally occur on the Atlantic coast of Florida north of Mosquito Lagoon, (e.g., the Halifax, GTM, St. Johns, Nassau, and St. Marys estuaries), as well as in a few scattered segments of Gulf Coast estuaries due to naturally high non-algal turbidity or color. Therefore, FDEP was unable to apply seagrass health as a screen in those specific areas.

on September 9, 2013. FDEP assessed attainment of this biological endpoint against the new DO criterion - a minimum daily DO saturation of 42%, 90% of the time, based on annual data. Because there were insufficient DO data to meet the data sufficiency requirements to calculate the seven-day and 30-day DO criteria, FDEP assessed whether the daily average criterion was attained in each year, rather than over the period of record or over the typical IWR assessment period of 7.5 years.

FDEP did not have sufficient data to calculate percent saturation in some estuary segments, so attainment of the DO criterion was determined by assessing data for a given year against the minimum allowable DO of 4.0 mg/l as a water column average which should be met 90% of the time within that year. If DO data were collected at multiple depths at a station and time, the average of the values was used to assess using the daily 42% saturation criterion unless any of the DO values were less than 2 mg/l. Then the lower 25th percentile of the measured values was used.

If an estuarine segment attained the 42% saturation target during a given year, it was determined to attain the designated use with respect to DO for that year. If an estuary did not meet the DO criteria, FDEP determined whether the DO levels were due to natural conditions. If DO levels were not due to natural conditions, FDEP did not consider that year's data for the segment in the reference condition analysis because the segment did not achieve the DO target for the year. More detail on both the existing Florida DO criteria and FDEP's analysis can be found in FDEP's TSD, "Derivation of Dissolved Oxygen Criteria to Protect Aquatic Life in Florida's Fresh and Marine Waters," March 2013.

Chl a

Maintenance of balanced algal populations as measured by chl *a* levels is an important sensitive biological endpoint because chl *a* is very responsive to nutrient enrichment, integral to aquatic food webs, well-established as an integrative measure of aquatic ecosystem condition, and correlated with changes in floral composition and subsequent faunal response. Chl *a* was used as the endpoint measure of balanced algal populations because elevated chl *a* concentrations resulting from nitrogen and phosphorus pollution alter the trophic state of estuarine and coastal waters. Elevated chl *a* concentrations not only increase algal turbidity that affects seagrass health, it also causes excess biomass which depresses or depletes DO. In addition, elevated chl *a* can also cause an increase in the frequency and magnitude of algal blooms. FDEP chose a chl *a* concentration of 20 µg/l, not to be exceeded more than 10% of the time annually, as a water quality threshold that prevents nuisance algal blooms. This value is consistent with the value identified by the EPA in its proposed NNC for estuaries as protective of nutrient-sensitive biological endpoints that are relevant to estuarine and coastal systems.[3] Thus, chl *a* concentrations exceeding 20 µg/l in a given estuarine water indicate an imbalance in natural populations of aquatic flora and fauna. FDEP used corrected chl *a* measurements when available and applied a correction factor to uncorrected chl *a* data when there were insufficient corrected chl *a* data. The correction factors were applied on an estuary-specific basis and only in cases with insufficient corrected chl *a* data to calculate criteria.

EPA Analysis

FDEP used the same or similar reference approach methodology to develop or revise the estuarine NNC contained in this submittal that was used to calculate NNC values contained in the previously approved

[3] USEPA. 2012. *Technical Support Document for U.S. EPA's Proposed Rule for Numeric Nutrient Criteria for Florida's Estuaries, Coastal Waters, and South Florida Inland Flowing Waters. Volume 1: Estuaries.* U.S. Environmental Protection Agency. Washington D.C.

Governor's Report. FDEP assembled reliable, vetted, representative data from the State's IWR database (Run 49) and supplemented them with STORET data. Additional quality control checks were applied and data from known impaired areas or periods of time were systematically removed (as detailed above). In order to provide greater assurance that data used were representative of estuarine use support, further screening thresholds were selected and applied to all data used. This additional screening effort used FDEP's current applicable state criteria and the same nutrient sensitive indicator values which the EPA identified as protective endpoints in development of its proposed estuarine criteria (FR Vol. 77, No. 243, p. 74942). The EPA concluded that these were scientifically defensible practices for selecting and screening the data used in criteria development that would ensure the protection of designated uses and therefore, are consistent with the CWA, 40 CFR Part 131.

Reference Period Approach Using AGMs

In this submittal FDEP generally set the magnitude of the estuary NNC as an AGM maximum established at the upper 80% prediction limit of the spatially average AGMs, with a frequency and duration of no more than one AGM exceeding the limit in a three year period (the AGM approach). The objective of this magnitude component is to maintain the long-term average concentration at the level observed in the baseline dataset that protects the designated use. The duration (measure of the period over which the magnitude will be applied) and frequency (how often the magnitude cannot be met while still protecting the designated uses) components of a criteria must be consistent with the derivation of the magnitude component to provide a consistent and appropriate level of protection and to avoid more than 10% Type I errors that identify a healthy system as being impaired. Therefore, long term targets were adjusted to allow for their application to a shorter duration with the acceptable Type I error rate for any given frequency by accounting for the annual variability above the mean. These annual target concentrations were derived as an upper percentile of the distribution of the AGM concentrations. Previous proposals by the EPA used three year assessment periods to express the magnitude and duration nutrient criteria components. Assuming a three year assessment period, it can be statistically determined that using the 80^{th} percentile of the AGMs from the long-term dataset, with a frequency and duration of no more than one exceedance during the three year period, will achieve the targeted 10% Type I error rate. Therefore, for most estuaries, the proposed criteria were developed so that the 80^{th} percentile of the AGM concentrations cannot be exceeded in more than once of three years.

The next most common criteria derivation the state adopted was based on a duration and frequency of "not to be exceeded more than 10% of the time [or 10% of the measurements]." The current amendments to the state's rule include some instances where the previous criterion was expressed as a certain duration and frequency, but now is expressed as the other (i.e., a previous AGM not to be exceeded more than once in three years is now an instantaneous value not to be exceeded more than 10% of the time). These changes were the result in a change in the size of the data set used to derive the criteria, through either the addition or deletion of data that were available to calculate the updated NNC. The primary method of an AGM derivation and the alternate method deriving a single sample maximum, are considered statistically valid and commonly used in combination as acceptable practices to address situations where the amount of data is limited. Both duration types have been previously approved by the EPA and are further discussed in the EPA's decision document for Florida's NNC dated September 26, 2013.

EPA Analysis

Since this approach is the same as was contained in the previous submittal, the EPA will continue to rely on its September 26, 2013, approval document that outlined the technical rationale and defensibility for those NNC.

Modified Reference Period Approach Using AGMs

The estuaries discussed in more detail below (Steinhatchee, Pellicer Creek, and Upper and Middle St. Marys River) are located within predominantly natural, undisturbed watersheds with a Landscape Development Intensity (LDI) index value of less than two and have no direct wastewater discharges. The rationale to support this modification was based on the observation that variability in ambient TN, TP, and chl *a* concentrations within these estuaries is driven almost exclusively by natural conditions (e.g. meteorological cycles). Because of the minimally disturbed nature of these watersheds, FDEP determined that it is more appropriate to control the Type 1 error rate at a lower rate in these estuaries than for estuaries with greater anthropogenic influences (increased development resulting in an LDI score higher than 2). The selection of a target Type 1 error rate must acknowledge the inherent natural and analytical variability of the dataset that represents the current condition of a waterbody. To address the unique nature of these minimally disturbed watersheds, FDEP calculated the criteria using an upper 90% prediction limit of the spatially averaged AGMs (rather than the 80% prediction interval), and hereafter referred to as the modified AGM approach, to ensure that the range of natural variability is fully captured and to control the true long-term Type 1 error at approximately 5% when assessed using the IWR methodology. This approach was developed based on a sophisticated analysis using the Monte-Carlo simulation (10,000 iterations) that calculated the exceedance probability using the IWR seven year assessment methodology for natural condition estuaries. These simulations evaluated how frequently a failure of the criteria would be detected based on the full IWR methodology. The Monte-Carlo simulation indicated that there would be an approximate 5% failure rate for the natural condition estuaries using the IWR assessment methodology assuming these estuaries maintain the reference period long-term geometric mean and variance.

EPA Analysis

FDEP's application of the modified reference approach to ensure that Type 1 errors are adequately controlled in minimally disturbed watersheds is a scientifically defensible method as determined by the EPA. Specifically, setting the criteria's magnitude value at the 90% prediction limit of the spatially averaged AGMs is representative of when the designated use is supported in minimally disturbed watersheds. Use of the 90% prediction limit of the spatially averaged AGMs will also ensure that minimally disturbed watersheds, as determined by their LDI score, will not be erroneously found to be impaired, thus accurately defining when the designated use is protected.

Reference Approaches Using Segment-wide Daily Average Values

The AGM (not to be exceeded more than once in a three year period) approach requires seven years of appropriate data to confidently calculate and, for some estuaries, the period of record was insufficient to derive such an annual limit. For these segments, FDEP proposed an alternative approach expressed as a segment-wide daily average value not to be exceeded in more than 10% of the daily averages. The daily average value was calculated as the upper 90% prediction limit of segment-wide daily average values, assuming a lognormal distribution (Helsel and Hiersh, 2002), for segments with a minimum of 20 daily

values. For segments with less than 20 values, the nonparametric 90th percentile was set as the daily average value. FDEP conducted a simulation study that investigated the effect of sample size on the calculated 90th percentile. The results of the study showed that the 90th percentile estimates converge on a consistent value at sample sizes ranging from 20 to 30. There is increased uncertainty in the percentile at smaller sample sizes; therefore, where it was necessary to calculate criteria based on limited data, a conservative approach was used wherein criteria were calculated using a non-parametric 90th percentile that was rounded down in the last decimal place (e.g., 8.08 µg/l chl *a* was rounded to 8.0 µg/l). The non-parametric 90th percentile, particularly at small sizes, is lower than an upper 90% prediction limit. The non-parametric 90th percentile approach was used for the following estuaries segments and parameters:

Segment	Parameter		
	TP	TN	Chl *a*
GICWW St. Andrew Bay to St. Joseph Bay			X
Apalachicola Offshore	X	X	X
Ochlockonee/Alligator Harbor Offshore	X	X	X
Ochlockonee River Estuary			X
Aucilla River Estuary	X	X	X
Aucilla Offshore	X	X	X

EPA Analysis

The reference using segment wide daily average value approach was previously used for the Governor's Report NNC action approved by the EPA on September 26, 2013, for chl *a* in the segment Gulf Intracoastal Waterway (GICWW) St. Andrew Bay to St. Joseph Bay. Since the Big Bend model was not used in this action as it was in the Governor's Report; the reference using segment wide daily average value approach was applied to estuaries that were previously developed using the Big Bend model. The EPA finds this technical approach scientifically defensible and protective of designated uses for these waterbodies as further discussed in the EPA's September 26, 2013 decision.

Reference Water/Site Approach

This approach was previously used for the Governor's Report NNC action approved by the EPA on September 26, 2013. Where a reference site approach was used, FDEP demonstrated that an adjacent or upstream site with protective criteria was functionally similar to a given estuarine segment. Criteria from such sites, therefore, would similarly protect uses in the downstream or adjacent estuarine segment. Where it was demonstrated by applying the aforementioned screens that the current conditions protect designated uses of the waterbody, and absent sufficient data to demonstrate a cause-effect relationship, distributional statistics were used to set criteria at a level that would maintain the current data distribution, accounting for natural temporal variability.

EPA Analysis

FDEP's use of distributional statistics (referred to as reference period or reference site approach by FDEP) can be considered a modification of the reference approach described in the EPA's peer

reviewed nutrient guidance.[4] For each estuarine segment considered, FDEP established by the process described above a filtered dataset from existing historical data that was representative of conditions of use support over time. FDEP used those datasets to conduct statistically valid analyses to derive criteria that are based on sound science and are protective of the designated uses.

Consideration of Recreational Uses

For waters with multiple use designations, water quality criteria must support the most sensitive use. 40 CFR Section 131.11(a). FDEP concluded that maintaining a well-balanced natural community of aquatic flora and fauna is a designated use that is more sensitive to nutrients than human recreational use and, therefore, criteria derived at levels that protect the more sensitive aquatic life use in marine waters of the State will inherently provide protection for the less sensitive recreational use. The seagrass and DO biological endpoints used by FDEP primarily identify conditions that protect healthy biological communities. The chl *a* screening endpoint also protects recreational uses by protecting against an excessive degree and duration of algal blooms.

Consideration of the "Years of Data" Language Contained in Estuary Introductory Paragraphs

FDEP added language in many of the estuary segment introductory paragraphs explaining what data will be used to assess whether the criteria are being attained. The new language addresses those criteria that are not to be exceeded in more than 10% of samples and those criteria which establish a long-term average that may not be exceeded, identifying the data the state will consider when measuring attainment of either category of criteria. Criteria that are not to be exceeded in more than 10% of the samples "shall be assessed over the most recent seven year period." For criteria expressed as a long-term average, FDEP must first calculate that average in order to assess attainment. The new language provides that the long-term average "shall be based on data from the most recent seven year period."

These revisions are not substantively different from the existing criteria. The new language does not revise the duration or frequency components for either type of criteria but merely establishes the time frame from which data should be used to assess attainment. As such, these revisions are data requirements applicable to the state assessment process and do not modify the magnitude, duration or frequency of the criteria. Therefore, the EPA has concluded that these provisions do not constitute new or revised water quality standards.

EPA'S DECISION

Each of FDEP's water quality standards revisions are addressed in detail below along with the EPA's analysis and conclusions. Underlined text indicates an addition to the existing rule language and strikeouts indicate deletion of text. The revisions contained in this submittal are primarily additions to Section 62-302.532, F.A.C., in the form of NNC for estuarine areas that were previously contained in the EPA-approved Governor's Report submittal. More detailed summaries of the revisions are set out below in the estuary by estuary analysis. The State divided each estuary into segments and then used a common overall approach to develop criteria for TN, TP, and chl *a*. The resulting criteria for each estuarine system were then added to the existing table in subsection 62-302.532(1). FDEP also made revisions to 62-302.532(3) and (4), which are discussed below in more detail.

[4] USEPA. 2001. *Nutrient Criteria Technical Guidance Manual: Estuarine and Coastal Marine Waters.* EPA–822–B–01–003. U.S. Environmental Protection Agency, Office of Water, Washington, DC; chapter 6&7.

Amendment to Rule 62-302.532, F.A.C. Numeric Nutrient Criteria for Estuaries Adopted in 2014
Subsection 62-302.532(1)

Subsection 62-302.532(1) Estuary-Specific Numeric Interpretations of the Narrative Nutrient Criterion now reads as follows.

> (1) Estuary-specific numeric interpretations of the narrative nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., are in the table below. The concentration-based estuary interpretations are open water, area-wide averages. Numeric values listed below for nutrient and nutrient response values do not apply to wetlands or to tidal tributaries that fluctuate between predominantly marine and predominantly fresh waters during typical climatic and hydrologic conditions unless specifically provided by name below. The interpretations expressed as load per million cubic meters of freshwater inflow are the total load of that nutrient to the estuary divided by the total volume of freshwater inflow to that estuary. The numeric values listed below will be superseded if, pursuant to subsection 62-302.531(2), F.A.C., a more recent numeric interpretation of the narrative nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., such as a Level II Water Quality Based Effluent Limitation (WQBEL), Site Specific Alternative Criterion (SSAC), Total Maximum Daily Load (TMDL), or Reasonable Assurance Demonstration, is established by the Department.

EPA Analysis

The EPA determined that the revisions contained in the provision 62-302.532(1), F.A.C. are clarifying statements for the detailed estuary specific entries contained in the estuary criteria table. The revisions also provide information regarding when an NNC can be superseded and the mechanisms by which an NNC can be superseded, defining the applicable standard for a particular waterbody as the most recently established numeric interpretation of the narrative nutrient criterion. The EPA found that all of these changes are non-substantive revisions to Florida's EPA-approved water quality standards and/or are consistent with other parts of the State's water quality standards that the EPA has already approved. Specifically regarding the language that refers to the most recently established NNC, this language is consistent with previously approved language contained in 62-302.531(2)(a), F.A.C. that similarly addresses numeric interpretations of the narrative nutrient criterion. While not addressed in subparagraph 62-302.532(1), pursuant to 40 CFR Section 131.21(c), a site-specific numeric interpretation of the narrative will not be effective for CWA purposes until that numeric interpretation is approved as a new or revised WQS by the EPA, pursuant to Section 303(c) of the CWA.

The EPA approves all of these clarifying statements as non-substantive changes that are consistent with the CWA and the EPA's implementing regulations. The EPA's approval of these clarifying statements as non-substantive changes, does not re-open the EPA's prior approval of the underlying substantive water quality standards.

EPA Analysis for Estuary-specific NNC Entries

(a) Clearwater Harbor/St. Joseph Sound

The Clearwater Harbor/St. Joseph Sound NNC were based on the reference period approach and were previously codified by FDEP and approved by the EPA.

Estuary	Total Phosphorus	Total Nitrogen	Chlorophyll *a*
(a) Clearwater Harbor/St. Joseph Sound	Criteria expressed as a~~A~~nnual geometric mean (AGM) values are not to be exceeded more than once in a three year period. Nutrient and nutrient response values do not apply to tidally influenced areas that fluctuate between predominantly marine and predominantly fresh waters during typical climatic and hydrologic conditions.		
1. St. Joseph Sound	0.05 mg/L as AGM	0.66 mg/L as AGM	3.1 µg/L as AGM
2. Clearwater North	0.05 mg/L as AGM	0.61 mg/L as AGM	5.4 µg/L as AGM
3. Clearwater South	0.06 mg/L as AGM	0.58 mg/L as AGM	7.6 µg/L as AGM

EPA Analysis

The EPA previously approved the NNC located at 62-302.532(1)(a) Clearwater Harbor/St. Joseph Sound in a decision dated November 30, 2012. In this rulemaking, FDEP revised the introductory paragraph and segments 1.-3., clarifying which criteria are expressed as annual geometric means (AGMs). The clarifications are non-substantive revisions that do not change the magnitude, duration or frequency of Florida's EPA-approved water quality standards. The EPA approves these revisions as non-substantive changes that are consistent with the CWA and the EPA's implementing regulations. The EPA's approval of these revisions as non-substantive changes, does not re-open the EPA's prior approval of the underlying substantive water quality standards.

(b) Tampa Bay

The Tampa Bay NNC were based on research, data, and work of the National Estuary Programs and the conceptual model used, relates to seagrass health and were previously codified by FDEP and approved by the EPA. The Alafia River Estuary NNC were based on a TMDL, previously approved by the EPA, and are codified into rule with this submittal.

(b) Tampa Bay	Criteria expressed as ton/million cubic meters of water are a~~A~~nnual totals and are not to be exceeded more than once in a three year period. ~~for nutrients and~~ Criteria expressed as annual ~~arithmetic~~ means are arithmetic means and are ~~for chlorophyll a,~~ not to be exceeded more than once in a three year period. For criteria expressed as the long-term average of annual means, the long-term average shall be based on data from the most recent seven-year period and shall not be exceeded. Nutrient and nutrient response values do not apply to tidally influenced areas that fluctuate between predominantly marine and predominantly fresh waters during typical climatic and hydrologic conditions.		
1. Old Tampa Bay	0.23 tons/million cubic meters of water	1.08 tons/million cubic meters of water	9.3 µg/L as annual mean
2. Hillsborough Bay	1.28 tons/million cubic meters of water	1.62 tons/million cubic meters of water	15.0 µg/L as annual mean
3. Middle Tampa Bay	0.24 tons/million cubic meters of water	1.24 tons/million cubic meters of water	8.5 µg/L as annual mean
4. Lower Tampa Bay	0.14 tons/million cubic meters of water	0.97 tons/million cubic meters of water	5.1 µg/L as annual mean
5. Boca Ciega North	0.18 tons/million cubic meters of water	1.54 tons/million cubic meters of water	8.3 µg/L as annual mean
6. Boca Ciega South	0.06 tons/million cubic meters of water	0.97 tons/million cubic meters of water	6.3 µg/L as annual mean
7. Terra Ceia Bay	0.14 tons/million cubic meters of water	1.10 tons/million cubic meters of water	8.7 µg/L as annual mean
8. Manatee River Estuary	0.37 tons/million cubic meters of water	1.80 tons/million cubic meters of water	8.8 µg/L as annual mean

9. Alafia River Estuary	0.86 mg/L as long-term average of annual means	See subsection 62-304.605(2), F.A.C.[5]	15.0 µg/L as annual mean

EPA Analysis

The EPA previously approved NNC for segments 1. through 8. within 62-302.532(1)(b) Tampa Bay, in a decision dated November 30, 2012. The EPA has determined that the revisions to 62-302.532(1)(b) Tampa Bay, introductory paragraph and 1.-8., clarifying which criteria are expressed as tons/million cubic meters of water and which are expressed as annual means, are clarifying, non-substantive revisions that do not change the magnitude, duration or frequency of Florida's EPA-approved water quality standards. The EPA approves these revisions as non-substantive changes that are consistent with the CWA and the EPA's implementing regulations. The EPA's approval of these revisions as non-substantive changes, does not re-open the EPA's prior approval of the underlying substantive water quality standards. The EPA's conclusions regarding the addition of the most recent seven year period language in the introductory paragraph is discussed starting on page 13, in the section titled "Consideration of the 'Years of Data' Language Contained in Estuary Introductory Paragraphs."

The EPA previously approved NNC for TP, TN, and chl *a* for the Alafia River Estuary, as set out in the EPA's decision dated September 26, 2013. In this rulemaking, FDEP has codified the TP, TN, and chl *a* criteria approved as part of the Governor's Report action. The duration components of the TN and chl a criteria are modified from the EPA's previous approval and are explained further below. The TN criterion for the Alafia River Estuary incorporates by reference subsection 62-304.605(2), F.A.C. The EPA is acting on and approves the following cross-referenced language: "The TMDL to address the low dissolved oxygen and nutrient impairments for the Alafia River above Hillsborough Bay is an annual average TN concentration of 0.65 mg/L." Specifically, regarding the TN criteria duration revision from "long term average of annual means not to be exceeded" to "an annual average not to be exceeded," this revision corrects a mistake in the Governor's Report, is consistent with language contained in subsection 62-304.605(2), F.A.C and previously approved by the EPA on September 26, 2013, and therefore, continues to protect the designated use. Per FDEP's responses to the EPA's January 22, 2016, email, it is the EPA's understanding that FDEP will modify the TSD to correct this error. The EPA approves the non-substantive changes for TN and TP as consistent with the CWA and the EPA's implementing regulations.

Lastly, the state revised the expression of the chl *a* criterion from a duration of "long term average of annual means" to "annual mean." FDEP explained the need for this correction in their response to the EPA's January 22, 2016, email which indicated the change was needed "because the chlorophyll a criterion for the Alafia River is based on the chlorophyll a criterion for the Lower Hillsborough Bay, which is expressed as an annual mean." The use of the same value for chl *a* in the Lower Hillsborough Bay is based on the restoration and protection of seagrass that occurs in that segment, which is a downstream waterbody of the Alafia River segment being addressed in this decision. It is an appropriate endpoint since there is no seagrass in the tidal Alafia River. For all of the reasons stated in the EPA's September 26, 2013, decision, this revision is determined to be protective of the designated use and it approved by the EPA.

[5] "The TMDL to address the low dissolved oxygen and nutrient impairments for the Alafia River above Hillsborough Bay is an annual average TN concentration of 0.65 mg/L."

(c) Sarasota Bay

The Sarasota Bay NNC were based on the reference period approach and were previously codified by FDEP and approved by the EPA.

(c) Sarasota Bay	Criteria expressed as aAnnual geometric mean (AGM) values for nutrients and annual arithmetic means for chlorophyll *a* are a, not to be exceeded more than once in a three year period. Nutrient and nutrient response values do not apply to tidally influenced areas that fluctuate between predominantly marine and predominantly fresh waters during typical climatic and hydrologic conditions.		
1. Palma Sola Bay	0.26 mg/L as AGM	0.93 mg/L as AGM	11.8 µg/L as annual mean
2. Sarasota Bay (Total Phosphorus and Chlorophyll *a*)	0.19 mg/L as AGM	See paragraph 62-302.532(i), F.A.C.	6.1 µg/L as annual mean
3. Roberts Bay	0.23 mg/L as AGM	0.54 mg/L as AGM	11.0 µg/L as annual mean
4. Little Sarasota Bay	0.21 mg/L as AGM	0.60 mg/L as AGM	10.4 µg/L as annual mean
5. Blackburn Bay	0.21 mg/L as AGM	0.43 mg/L as AGM	8.2 µg/L as annual mean
(i) Sarasota Bay (Total Nitrogen)	No change.		

EPA Analysis

The EPA previously approved NNC for segments 1. through 5. within 62-302.532(1)(c) Sarasota Bay, in a decision dated November 30, 2012. The EPA has determined that the revisions in 62-302.532(1)(c) Sarasota Bay, introductory paragraph, 1.-5., clarifying which criteria are expressed as AGMs and which are expressed as annual means, and (i), which clarifies the organization of the rows and parameters for Sarasota Bay, are clarifying, non-substantive revisions that do not change the magnitude, duration or frequency of Florida's EPA-approved water quality standards. The EPA approves all these revisions as non-substantive changes that are consistent with the CWA and the EPA's implementing regulations. The EPA's approval of these revisions as non-substantive changes, does not re-open the EPA's prior approval of the underlying substantive water quality standards. Lastly, as a point of clarification, the EPA has determined that the duration for chl *a*, stated as an "arithmetic mean" and "annual mean" are the same.

(d) Charlotte Harbor/Estero Bay

The Charlotte Harbor/Estero Bay NNC were based on the reference period approach and were previously codified by FDEP and approved by the EPA.

(d) Charlotte Harbor/Estero Bay	Criteria expressed as aAnnual ~~arithmetic~~ means ~~values for nutrients and annual arithmetic means for chlorophyll a,~~ are arithmetic means and are not to be exceeded more than once in a three year period. For criteria expressed as long-term averages, the long-term average shall be based on data from the most recent seven-year period and shall not be exceeded. Criteria expressed as annual geometric means (AGM) are not be exceeded more than once in a three year period. For criteria expressed as not to be exceeded in more than 10 percent of the samples, the criteria shall be assessed over the most recent seven year period. Nutrient and nutrient response values do not apply to tidally influenced areas that fluctuate between predominantly marine and predominantly fresh waters during typical climatic and hydrologic conditions.		
1. Dona and Roberts Bay	0.18 mg/L as annual mean	0.42 mg/L as annual mean	4.9 µg/L as annual mean
2. Upper Lemon Bay	0.26 mg/L as annual mean	0.56 mg/L as annual mean	8.9 µg/L as annual mean
3. Lower Lemon Bay	0.17 mg/L as annual mean	0.62 mg/L as annual mean	6.1 µg/L as annual mean

4. Charlotte Harbor Proper	0.19 mg/L as annual mean	0.67 mg/L as annual mean	6.1 µg/L as annual mean
5. Pine Island Sound	0.06 mg/L as annual mean	0.57 mg/L as annual mean	6.5 µg/L as annual mean
6. San Carlos Bay	0.045 mg/L as long-term average ~~0.07 mg/L~~	0.44 mg/L as long-term average ~~0.56 mg/L~~	3.7 µg/L as long-term average ~~3.5 µg/L~~
7. Tidal Myakka River	0.31 mg/L as annual mean	1.02 mg/L as annual mean	11.7 µg/L as annual mean
8. Tidal Peace River	0.50 mg/L as annual mean	1.08 mg/L as annual mean	12.6 µg/L as annual mean
9. Matlacha Pass	0.08 mg/L as annual mean	0.58 mg/L as annual mean	6.1 µg/L as annual mean
10. Estero Bay (including Tidal Imperial River)	0.07 mg/L as annual mean	0.63 mg/L as annual mean	5.9 µg/L as annual mean
11. Little Hickory Bay	0.070 mg/L as AGM	0.63 mg/L as AGM	5.9 µg/L as AGM
12. Water Turkey Bay	0.057 mg/L as AGM	0.47 mg/L as AGM	5.8 µg/L as AGM
13. Moorings Bay	0.040 mg/L, not to be exceeded in more than ten percent of the samples	0.85 mg/L, not to be exceeded in more than ten percent of the samples	8.1 µg/L as AGM
14. Upper Caloosahatchee River Estuary	0.086 mg/L as long-term average	See subsection 62-304.800(2), F.A.C.[6]	4.2 µg/L as long-term average
15. Middle Caloosahatchee River Estuary	0.055 mg/L as long-term average	See subsection 62-304.800(2), F.A.C.[6]	6.5 µg/L as long-term average
16. Lower Caloosahatchee River Estuary	0.040 mg/L as long-term average	See subsection 62-304.800(2), F.A.C.[6]	5.6 µg/L as long-term average

EPA Analysis

The EPA previously approved NNC for segments 1. through 10. within 62-302.532(1)(d) Charlotte Harbor/Estero Bay, in a decision dated November 30, 2012. The EPA has determined that revisions to those waterbody entries in 62-302.532(1)(d) Charlotte Harbor/Estero Bay, introductory paragraph, 1.-5., 7., 9., and 10., which clarify frequency for criteria expressed as annual means, are clarifying, non-substantive revisions that do not change the magnitude, duration or frequency of Florida's EPA-approved water quality standards. The EPA approves all of these clarifying statements as non-substantive changes that are consistent with the CWA and the EPA's implementing regulations. The EPA's approval of these revisions as non-substantive changes, does not re-open the EPA's prior approval of the underlying substantive water quality standards. With regard to San Carlos Bay, FDEP adopted NNC for segment 6, San Carlos Bay, and the EPA approved those NNC on November 30, 2012. As part of the state's 2013 submittal of new and revised estuary NNC, the EPA reviewed a revised set of NNC for San Carlos Bay, which the EPA approved in a decision dated September 26, 2013. In this most recent rulemaking, FDEP is codifying the NNC for San Carlos Bay, into 62-302.532(1)(d)6. The EPA approves this codification as a non-substantive change that is consistent with the CWA and the EPA's implementing regulations. The EPA's approval of this codification does not re-open the EPA's prior approval of the underlying substantive water quality standards. The EPA's conclusions regarding the additions of the most recent seven year period language in the introductory paragraph is discussed starting on page 13, in the section titled "Consideration of the 'Years of Data' Language Contained in Estuary Introductory Paragraphs."

The NNC for Little Hickory Bay and Water Turkey Bay were approved in a decision dated September 26, 2013. In this rulemaking, FDEP has codified those NNC at 62-302.532(1)(d)11. and 12. The EPA approves this codification as a non-substantive change that is consistent with the CWA and the EPA's implementing regulations. The EPA's approval of this codification does not re-open the EPA's prior approval of the underlying substantive water quality standards.

[6] "The TMDL for the Tidal Caloosahatchee estuary downstream of the S-79 Franklin Lock is 9,086,094 pounds of Total Nitrogen (TN) per year . . ."

The EPA previously approved the NNC for Tidal Peace River as set out in the EPA's decision dated September 9, 2013. In this rulemaking, FDEP has codified the NNC for this segment at 62-302.532(1)(d)8. The EPA approves this codification as a non-substantive change that is consistent with the CWA and the EPA's implementing regulations. The EPA's approval of this codification does not re-open the EPA's prior approval of the underlying substantive water quality standards.

The NNC for Moorings Bay were approved in a decision dated September 26, 2013. In this rulemaking, the Moorings Bay NNC were revised, and those revisions were codified at 62-302.532(1)(d)13., with this submittal. The NNC were derived using the reference period approach with data sets that met the biological screen thresholds outlined in the "Numeric Nutrient Criteria for Estuaries Addressed in the August 1, 2013, Report to the Governor and Legislature" Technical Support Document dated October 6, 2014. The EPA found these biological screens to be scientifically defensible in deriving NNC that would protect the designated use. FDEP used newly available data from IWR Run 49 and some datasets from the Florida STORET database. Deriving NNC with this combined data set ensured that the most complete and up-to-date data (end of 2013) were used. In addition, some TP data previously used were found to be erroneous and were excluded from the NNC calculation submitted here. For Moorings Bay, use of the updated data set to derive NNC using the reference period approach resulted in a change in the magnitudes for the TP and TN criteria, and magnitude, duration, and frequency changes for the chl *a* criterion when compared to the previously approved Governor's Report values. On page 96 of FDEP's TSD, FDEP provides the following rationale, and the EPA determined these changes are defensible, and therefore continue to be protective of designated uses.

> Interim criteria presented in the Report to the Governor and Legislature (Department 2013d) were also developed using the reference period approach, but the proposed criteria for TP and TN are lower than the interim criteria, and the criteria for chl *a* is expressed as an AGM rather than a value not to be exceeded more than 10% of the time. The changes in the criteria are the result of additional nutrient data available for the analysis and the exclusion of 2010 due to nonattainment of the DO saturation target. The year 2010 was previously included in the calculation of the interim criteria; however, a reanalysis of the revised dataset indicated that the bay did not achieve the target during that year. Additionally, erroneous TP data collected between 1990 and 1996 by Collier County, that had been previously included in the calculations, were excluded from the criteria calculations. The values were highly suspect and were excluded following consultation with and the recommendation of the data originator (i.e., Collier County). The exclusion of these erroneous data resulted in a significant decrease in the TP criterion.

Lastly, the EPA approved the Hierarchy 1 load based criteria for TN in the Upper Caloosahatchee Estuary, Middle Caloosahatchee River Estuary, and Lower Caloosahatchee River Estuary segments in a decision dated July 2, 2013. The NNC for TP and chl *a*, as well as a concentration based TN criterion, were approved in the Governor's Report on September 26, 2013. In this rulemaking, FDEP is codifying these three segments into rule at 62-302.532(1)(d)14. through 16. The EPA approves these codifications as non-substantive changes that are consistent with the CWA and the EPA's implementing regulations. The EPA's approval of these codifications does not re-open the EPA's prior approval of the underlying substantive water quality standards. The TN criteria for the Upper, Middle, and Lower Caloosahatchee River Estuary incorporate by reference subsection 62-304.800(2), F.A.C. The EPA is acting on and approves the following cross-referenced language: "The TMDL for the Tidal Caloosahatchee estuary downstream of the S-79 Franklin Lock is 9,086,094 pounds of Total Nitrogen (TN) per year . . ." The language contained in 62-304.800(2) replaces the previously approved concentration value with a load

value. The load values correspond to the NNC concentration values the EPA approved on September 26, 2013 and, therefore, provide the same level of protection for these waters. This action approves the revision in how the NNC for the estuary is expressed (concentration vs. load), for the same reasons set out in the September 26, 2013 approval.

(e) Tidal Cocohatchee River/Ten Thousand Islands

The Tidal Cocohatchee River/Ten Thousand Islands NNC were based on the "maintain healthy conditions" approach and were previously codified by FDEP and approved by the EPA.

(e) Tidal Cocohatchee River/Ten Thousand Islands	Criteria expressed as a~~A~~nnual geometric means (AGM) are ~~that shall~~ not to be exceeded more than once in a three year period.		
1. Tidal Cocohatchee River	0.057 mg/L as AGM	0.47 mg/L as AGM	5.8 µg/L as AGM
2. Collier Inshore	0.032 mg/L as AGM	0.25 mg/L as AGM	3.1 µg/L as AGM
3. Rookery Bay/Marco Island	0.046 mg/L as AGM	0.30 mg/L as AGM	4.9 µg/L as AGM
4. Naples Bay	0.045 mg/L as AGM	0.57mg/L as AGM	4.3 µg/L as AGM
5. Inner Gulf Shelf	0.018 mg/L as AGM	0.29 mg/L as AGM	1.6 µg/L as AGM
6. Middle Gulf Shelf	0.016 mg/L as AGM	0.26 mg/L as AGM	1.4 µg/L as AGM
7. Outer Gulf Shelf	0.013 mg/L as AGM	0.22 mg/L as AGM	1.0 µg/L as AGM
8. Blackwater River	0.053 mg/L as AGM	0.41 mg/L as AGM	4.1 µg/L as AGM
9. Coastal Transition Zone	0.034 mg/L as AGM	0.61 mg/L as AGM	3.9 µg/L as AGM
10. Gulf Islands	0.038 mg/L as AGM	0.44 mg/L as AGM	3.4 µg/L as AGM
11. Inner Waterway	0.033 mg/L as AGM	0.69 mg/L as AGM	5.2 µg/L as AGM
12. Mangrove Rivers	0.021 mg/L as AGM	0.71 mg/L as AGM	3.7 µg/L as AGM
13. Ponce de Leon	0.024 mg/L as AGM	0.52 mg/L as AGM	3.0 µg/L as AGM
14. Shark River Mouth	0.022 mg/L as AGM	0.75 mg/L as AGM	2.2 µg/L as AGM
15. Whitewater Bay	0.026 mg/L as AGM	0.82 mg/L as AGM	4.1 µg/L as AGM

EPA Analysis

The EPA previously approved NNC for segments 1. through 15. within 62-302.532(1)(e) Tidal Cocohatchee River/Ten Thousand Islands, in a decision dated November 30, 2012. The EPA has determined that the revisions in 62-302.532(1)(e) Tidal Cocohatchee River/Ten Thousand Islands, introductory paragraph and 1.-15., clarifying which criteria are expressed as AGMs, are clarifying, non-substantive revisions that do not change the magnitude, duration or frequency of Florida's EPA-approved water quality standards. The EPA approves all these revisions as non-substantive changes that are consistent with the CWA and the EPA's implementing regulations. The EPA's approval of these revisions as non-substantive changes, does not re-open the EPA's prior approval of the underlying substantive water quality standards.

(f) Florida Bay

The Florida Bay NNC were based on the "maintain healthy conditions" approach and were previously codified by FDEP and approved by the EPA.

(f) Florida Bay	Criteria expressed as a~~A~~nnual geometric means (AGM) are ~~that shall~~ not to be exceeded more than once in a three year period.		
1. Central Florida Bay	0.019 mg/L as AGM	0.99 mg/L as AGM	2.2 µg/L as AGM
2. Coastal Lakes	0.045 mg/L as AGM	1.29 mg/L as AGM	9.3 µg/L as AGM

3. East Central Florida Bay	0.007 mg/L as AGM	0.65 mg/L as AGM	0.4 µg/L as AGM
4. Northern Florida Bay	0.010 mg/L as AGM	0.68 mg/L as AGM	0.8 µg/L as AGM
5. Southern Florida Bay	0.009 mg/L as AGM	0.64 mg/L as AGM	0.8 µg/L as AGM
6. Western Florida Bay	0.015 mg/L as AGM	0.37 mg/L as AGM	1.4 µg/L as AGM

EPA Analysis

The EPA previously approved NNC for segments 1. through 6. within 62-302.532(1)(f) Florida Bay, in a decision dated November 30, 2012. The EPA has determined that the revisions in 62-302.532(1)(f) Florida Bay, introductory paragraph and 1.-6., clarifying which criteria are expressed as AGMs, are clarifying, non-substantive revisions that do not change the magnitude, duration or frequency of Florida's EPA-approved water quality standards. The EPA approves all these revisions as non-substantive changes that are consistent with the CWA and the EPA's implementing regulations. The EPA's approval of these revisions as non-substantive changes, does not re-open the EPA's prior approval of the underlying substantive water quality standards.

(g) Florida Keys

The Florida Keys NNC were based on the "maintain healthy conditions" approach and were previously codified by FDEP and approved by the EPA.

(g) Florida Keys	Criteria expressed as a~~A~~nnual geometric means (AGM) are ~~that shall~~ not to be exceeded more than once in a three year period.		
1. Back Bay	0.009 mg/L as AGM	0.25 mg/L as AGM	0.3 µg/L as AGM
2. Backshelf	0.011 mg/L as AGM	0.23 mg/L as AGM	0.7 µg/L as AGM
3. Lower Keys	0.008 mg/L as AGM	0.21 mg/L as AGM	0.3 µg/L as AGM
4. Marquesas	0.008 mg/L as AGM	0.21 mg/L as AGM	0.6 µg/L as AGM
5. Middle Keys	0.007 mg/L as AGM	0.22 mg/L as AGM	0.3 µg/L as AGM
6. Oceanside	0.007 mg/L as AGM	0.17 mg/L as AGM	0.3 µg/L as AGM
~~6. Oceanside~~	~~0.007 mg/L~~	~~0.17 mg/L~~	~~0.3 µg/L~~
7. Upper Keys	0.007 mg/L as AGM	0.18 mg/L as AGM	0.2 µg/L as AGM

EPA Analysis

The EPA previously approved NNC for segments 1. through 7. within 62-302.532(1)(g) Florida Keys, for all of the reasons contained in the EPA's decision dated November 30, 2012. The EPA has determined that the revisions in 62-302.532(1)(g) Florida Keys, introductory paragraph and 1.-7., clarifying which criteria are expressed as AGMs, are clarifying, non-substantive revisions that do not change the magnitude, duration or frequency of Florida's EPA-approved water quality standards. The EPA approves all these revisions as non-substantive changes that are consistent with the CWA and the EPA's implementing regulations. The EPA's approval of these revisions as non-substantive changes, does not re-open the EPA's prior approval of the underlying substantive water quality standards.

(h) Biscayne Bay

The Biscayne Bay NNC were based on the "maintain healthy conditions" approach and were previously codified by FDEP and approved by the EPA.

(h) Biscayne Bay	Criteria expressed as a~~A~~nnual geometric means (AGM) are ~~that shall~~ not to be exceeded more than once in a three year period.		
1. Card Sound	0.008 mg/L as AGM	0.33 mg/L as AGM	0.5 µg/L as AGM
2. Manatee Bay – Barnes Sound	0.007 mg/L as AGM	0.58 mg/L as AGM	0.4 µg/L as AGM
3. North Central Inshore	0.007 mg/L as AGM	0.31 mg/L as AGM	0.5 µg/L as AGM
4. North Central Outer-Bay	0.008 mg/L as AGM	0.28 mg/L as AGM	0.7 µg/L as AGM
5. Northern North Bay	0.012 mg/L as AGM	0.30 mg/L as AGM	1.7 µg/L as AGM
6. South Central Inshore	0.007 mg/L as AGM	0.48 mg/L as AGM	0.4 µg/L as AGM
7. South Central Mid-Bay	0.007 mg/L as AGM	0.35 mg/L as AGM	0.2 µg/L as AGM
8. South Central Outer-Bay	0.006 mg/L as AGM	0.24 mg/L as AGM	0.2 µg/L as AGM
9. Southern North Bay	0.010 mg/L as AGM	0.29 mg/L as AGM	1.1 µg/L as AGM

EPA Analysis

The EPA previously approved NNC for segments 1. through 8. within 62-302.532(1)(h) Biscayne Bay, for all of the reasons contained in the EPA's decision dated November 30, 2012. The EPA has determined that the revisions in 62-302.532(1)(h) Biscayne Bay, introductory paragraph and 1.-9., clarifying which criteria are expressed as AGMs, are clarifying, non-substantive revisions that do not change the magnitude, duration or frequency of Florida's EPA-approved water quality standards. The EPA approves all these revisions as non-substantive changes that are consistent with the CWA and the EPA's implementing regulations. The EPA's approval of these revisions as non-substantive changes, does not re-open the EPA's prior approval of the underlying substantive water quality standards.

(i) Sarasota Bay

See discussion of (c) Sarasota Bay section above for a discussion of non-substantive change to (i) Sarasota Bay.

(j) Clam Bay

(j) No change.

EPA Analysis

The NNC entry for Clam Bay is referenced here for completeness. This provision has not been revised; therefore, no further EPA review or action is necessary.

(k) Perdido Bay

The Perdido Bay NNC were based on the reference condition and distributional statistics approaches and were previously approved by the EPA.

(k) Perdido Bay	~~For bay segments with c~~Criteria expressed as annual geometric means (AGM) are ~~the values shall~~ not to be exceeded more than once in a three year period. For all other bay segments, the criteria shall not be exceeded in more than 10 percent of the measurements and shall be assessed over the most recent seven year period. Nutrient and nutrient response values do not apply to tidally influenced areas that fluctuate between predominantly marine and predominantly fresh waters during typical climatic and hydrologic conditions.
1. thru 4. No change.	

EPA Analysis

The EPA determined that the revisions in the introductory language for 62-302.532(1)(k) Perdido Bay, are clarifying, non-substantive revisions that do not change the magnitude, duration or frequency of Florida's EPA-approved water quality standards. The EPA approves these revisions as non-substantive changes that are consistent with the CWA and the EPA's implementing regulations. The EPA's approval of these revisions as non-substantive changes, does not re-open the EPA's prior approval of the underlying substantive water quality standards. The EPA's conclusions regarding the addition of the most recent seven year period language in the introductory paragraph is discussed starting on page 13, in the section titled "Consideration of the 'Years of Data' Language Contained in Estuary Introductory Paragraphs."

(l) Pensacola Bay

The Pensacola Bay NNC were based on the reference condition approach and were previously approved by the EPA.

(l) Pensacola Bay	For bay segments with criteria expressed as annual geometric means (AGM), the values shall not be exceeded more than once in a three year period. For criteria expressed as the long-term average of annual means, the long-term average shall be based on data from the most recent seven-year period and shall not be exceeded. For all other bay segments, the criteria shall not be exceeded in more than 10 percent of the measurements. Nutrient and nutrient response values do not apply to tidally influenced areas that fluctuate between predominantly marine and predominantly fresh waters during typical climatic and hydrologic conditions.		
1. through 6. No change.			
7. Upper Escambia Bay and Judges Bayou	See subsection 62-304.330(10), F.A.C.[7]	See subsection 62-304.330(10), F.A.C.[7]	7.4 µg/L as long-term average of annual means

EPA Analysis

The EPA previously approved NNC for the first six of segments 62-302.532(1)(l) Pensacola Bay in a decision dated September 26, 2013. In the current rulemaking, FDEP revised the introductory paragraph and added a seventh segment, Upper Escambia Bay and Judges Bayou. The EPA has determined that the revision in the introductory paragraph, clarifying which criteria are expressed as long-term averages of annual means, and is a clarifying, non-substantive revision that does not change the magnitude, duration or frequency of Florida's EPA-approved water quality standards. The EPA approves this revision as a non-substantive change that is consistent with the CWA and the EPA's implementing regulations. The EPA's approval of this clarifying statement as a non-substantive change, does not re-open the EPA's prior approval of the underlying substantive water quality standards. The EPA's conclusions regarding the addition of the most recent seven year period language in the introductory paragraph is discussed starting on page 13, in the section titled "Consideration of the 'Years of Data' Language Contained in Estuary Introductory Paragraphs."

As part of the Governor's Report, the EPA approved NNC for Upper Escambia Bay and Judges Bayou in a decision dated September 26, 2013. The EPA re-approved these same NNC as Hierarchy 1 NNC in

[7] "The total phosphorus (TP) TMDL for the Pensacola Bay estuary required to restore the marine sections of North Escambia Bay and Judges Bayou is 601,345 lbs/year, a 35 percent reduction in TP from the 2002-2009 period to address nutrient impairments. The existing total nitrogen (TN) loading to the Pensacola Bay estuary is 16,795,853 lbs/year, and no reduction is required."

the EPA's decision dated August 19, 2014, for all of the reasons stated in the September 26, 2013, decision. With this rulemaking, FDEP is codifying this segment into rule. The EPA approves this codification as a non-substantive change that is consistent with the CWA and the EPA's implementing regulations. The EPA's approval of this codification does not re-open the EPA's prior approval of the underlying substantive water quality standards. The TN and TP criteria for Upper Escambia Bay and Judges Bayou incorporate by reference subsection 62-304.330(10). The EPA is acting on and approves the following cross-referenced language: "The total phosphorus (TP) TMDL for the Pensacola Bay estuary required to restore the marine sections of North Escambia Bay and Judges Bayou is 601,345 lbs/year, a 35 percent reduction in TP from the 2002-2009 period to address nutrient impairments. The existing total nitrogen (TN) loading to the Pensacola Bay estuary is 16,795,853 lbs/year, and no reduction is required." It should be noted, that the pounds per year values included for TN and TP shown in footnote 7 are consistent with the levels approved by the EPA on September 26, 2013, although the summary table associated with that action did not correctly summarize the revision, referring to "lbs/yr, long term average of the annual means not to be exceeded" instead of simply "lbs/yr, not to be exceeded." The details in footnote 7 and the criteria summary table of this current decision document accurately reflects the duration for TP and TN criteria that apply to this segment. Although not included as criteria themselves, FDEP's 2015 TSD discussed the range of annual average concentrations associated with the adopted long term average chl *a*, as well as the TN and TP loading based criteria, in the table above. The TSD indicates that modeling "indicated that the range in annual average concentrations of chl *a* (between 3.5 and 8.4 µg/L), TN (between 0.37 and 0.56 mg/L), and TP (between 0.022 and 0.041 mg/L) for Upper Escambia Bay would result in meeting all targets for light penetration (20% light at a 0.6-meter depth to protect seagrass), chl *a*, and DO."

(m) Choctawhatchee Bay

The Choctawhatchee Bay NNC were based on the reference condition approach and were previously approved by the EPA.

(m) No change.

EPA Analysis

The NNC entry for the Choctawhatchee Bay is referenced here for completeness. This provision has not been revised; therefore, no further EPA review is necessary.

(n) St. Andrew Bay

The St. Andrew Bay NNC were based on the reference condition approach for the first four segments and the reference water approach for the fifth segment listed below. All five segments were previously approved by the EPA. The EPA's approval of the fifth segment was for a segment described as St. Andrew Sound, which was contained in the Governor's Report, but in this current rulemaking has been revised to the name of Crooked Island Sound and is being codified into 62-302.532(1)(n).

(n) St. Andrew Bay	Criteria for all bay segments are expressed as annual geometric mean (AGM) values not to be exceeded more than once in a three year period. Nutrient and nutrient response values do not apply to tidally influenced areas that fluctuate between predominantly marine and predominantly fresh waters during typical climatic and hydrologic conditions.		
1. East Bay	0.016 mg/L as AGM	0.33 mg/L as AGM	3.9 µg/L as AGM
2. North Bay	0.014 mg/L as AGM	0.28 mg/L as AGM	3.1 µg/L as AGM

3. St. Andrew Bay	0.019 mg/L as AGM	0.34 mg/L as AGM	3.7 µg/L as AGM
4. West Bay	0.017 mg/L as AGM	0.35 mg/L as AGM	3.8 µg/L as AGM
5. Crooked Island Sound	0.019 mg/L as AGM	0.34 mg/L as AGM	3.7 µg/L as AGM

EPA Analysis

The EPA previously approved NNC for the first four segments of 62-302.532(1)(n) St. Andrew Bay for all of the reasons contained in a decision dated September 26, 2013. The EPA has determined that the revisions in 62-304.532(1)(n) St. Andrew Bay, introductory paragraph and 1.-4., clarifying which criteria are expressed as AGMs, are clarifying, non-substantive revisions that do not change the magnitude, duration or frequency of Florida's EPA-approved water quality standards. The EPA approves these revisions as non-substantive changes that are consistent with the CWA and the EPA's implementing regulations. The EPA's approval of these revisions as non-substantive changes, does not re-open the EPA's prior approval of the underlying substantive water quality standards.

As described above, the fifth segment, previously called "St. Andrew Sound," was approved by the EPA in a decision dated September 26, 2013. The segment was revised to reflect a new name, Crooked Island Sound, to be consistent with the more locally accepted name. The EPA considers this change to be a clarifying statement that does not represent a substantive change, given that the segment spatially aligns with the segment previously approved as St. Andrew Sound and the criteria values have not changed. The only other change the state adopted was the codification of this segment into the existing St. Andrew Bay section of the regulations. The EPA approves these revisions as non-substantive changes that are consistent with the CWA and the EPA's implementing regulations. The EPA's approval of these revisions as non-substantive changes, does not re-open the EPA's prior approval of the underlying substantive water quality standards.

(o) St. Joseph Bay

The St. Joseph Bay NNC were based on the reference condition approach and were previously approved by the EPA.

(o) St. Joseph Bay	Criteria for all bay segments are expressed as annual geometric mean (AGM) values not to be exceeded more than once in a three year period. Nutrient and nutrient response values do not apply to tidally influenced areas that fluctuate between predominantly marine and predominantly fresh waters during typical climatic and hydrologic conditions.		
St. Joseph Bay	0.021 mg/L as AGM	0.34 mg/L as AGM	3.8 µg/L as AGM

EPA Analysis

The EPA previously approved NNC for St. Joseph Bay in a decision dated September 26, 2013. In this rulemaking, FDEP clarified the abbreviation for the duration component of the criteria and that all the criteria are expressed as annual geometric means. The EPA has determined that these revisions are clarifying, non-substantive revisions that do not change the magnitude, duration or frequency of Florida's EPA-approved water quality standards. The EPA approves these revisions as non-substantive changes that are consistent with the CWA and the EPA's implementing regulations. The EPA's approval of these revisions as non-substantive changes, does not re-open the EPA's prior approval of the underlying substantive water quality standards.

(p) Apalachicola Bay and Alligator Harbor

The Apalachicola Bay and Alligator Harbor NNC were based on the reference condition approach and were previously approved by the EPA. Apalachicola Offshore is now based on a reference waterbody and Alligator Harbor is now based on the reference period approach.

(p) Apalachicola Bay and Alligator Harbor	For bay segments with criteria expressed as annual geometric means (AGM), the values shall not be exceeded more than once in a three year period. For all other bay segments, the criteria shall not be exceeded in more than 10 percent of the measurements and shall be assessed over the most recent seven year period. Nutrient and nutrient response values do not apply to tidally influenced areas that fluctuate between predominantly marine and predominantly fresh waters during typical climatic and hydrologic conditions.		
1. through 4. No change.			
5. Apalachicola Offshore	0.032 mg/L	0.57 mg/L	8.2 µg/L
6. Alligator Harbor	0.028 mg/L as AGM	0.42 mg/L as AGM	6.0 µg/L as AGM

EPA Analysis

The EPA previously approved NNC for four segments of 62-302.532(1)(p) Apalachicola Bay in a decision dated September 26, 2013. In this rulemaking, FDEP revised the title of 62-302.532(1)(p) to include Alligator Harbor, as well as identify criteria for two additional segments. The EPA has determined that the revisions in 62-304.532(1)(p) Apalachicola Bay and Alligator Harbor's title is a clarifying, non-substantive revision that does not change the magnitude, duration or frequency of Florida's EPA-approved water quality standards. The EPA approves this revision as a non-substantive change that is consistent with the CWA and the EPA's implementing regulations. The EPA's approval of this revision as a non-substantive change, does not re-open the EPA's prior approval of the underlying substantive water quality standards. The EPA's conclusions regarding the addition of the most recent seven year period language in the introductory paragraph is discussed starting on page 13, in the section titled "Consideration of the 'Years of Data' Language Contained in Estuary Introductory Paragraphs."

The EPA previously approved NNC for Apalachicola Offshore in a decision dated September 26, 2013. Those criteria were based on the larger Apalachee Bay/Big Bend area hydrodynamic/water quality model developed by the EPA as part of its efforts to develop NNC for Florida. Upon further review, FDEP concluded that the EPA-developed model was not adequately calibrated to serve as the basis for NNC for the entire Big Bend, including the Apalachicola Offshore segment. Because of insufficient data to check biological screens, FDEP was also unable to calculate NNC for Apalachicola Offshore based on the reference period approach using AGMs and instead used the segment wide daily value reference approach. The Ochlockonee/Alligator Harbor Offshore systems were used as reference systems because of their adjacency. Based on this information, FDEP has revised the NNC, and is codifying the revised NNC for Apalachicola Offshore into rule by this action. The EPA finds that the use of Ochlockonee/Alligator Harbor Offshore NNC as a reference estuary for Apalachicola Offshore is appropriate because of their adjacency and similar physical and hydrologic characteristics as part of the larger Big Bend system. The revised NNC are, therefore, protective of the Apalachicola Offshore designated use and the EPA approves these revised NNC.

The EPA previously approved NNC for Alligator Harbor in a decision dated September 26, 2013. In this rulemaking, FDEP used the reference period approach, as was the case for the previous NNC, but included more current data (1971-2014) compared to the Governor's Report approval (1971-2012). The derivation of the NNC was based on six years of uncorrected chl *a* data and one additional year of corrected chl *a* data to achieve the minimum number of years for the preferred AGM approach, with the resultant criteria being based mainly on uncorrected values. The EPA approves the revised NNC for Alligator Harbor using the reference period approach and finds this method, as outlined in the September 26, 2013, decision and above in this decision, scientifically defensible and therefore protective of the designated use.

(q) Loxahatchee River Estuary

The Loxahatchee River Estuary area NNC were based on the reference period, and Loxahatchee River Estuary (Southwest Fork) was based on the reference water approach and all the segments were previously approved by the EPA. Loxahatchee River Estuary (Southwest Fork) continues to be based on the reference water approach, but is now based on a different waterbody than previously used.

(q) Loxahatchee River Estuary	For estuary segments with criteria expressed as annual geometric means (AGM), the values shall not be exceeded more than once in a three year period. For all other estuary segments, the criteria shall not be exceeded in more than 10 percent of the measurements and shall be assessed over the most recent seven year period.		
1. through 3. No change.			
4. Loxahatchee River Estuary (Southwest Fork)	0.075 mg/L as AGM	1.26 mg/L as AGM	5.5 µg/L as AGM

EPA Analysis

The EPA previously approved NNC for the first three segments of Loxahatchee River Estuary in a decision dated September 26, 2013. In the current rulemaking, FDEP made a revision to the introductory paragraph and added a fourth segment to 62-302.532(1)(q). The EPA's conclusions regarding the addition of the most recent seven year period language in the introductory paragraph is discussed starting on page 13, in the section titled "Consideration of the 'Years of Data' Language Contained in Estuary Introductory Paragraphs."

The EPA previously approved NNC for the Loxahatchee River Estuary (Southwest Fork) in the decision dated September 26, 2013, using the Middle Loxahatchee segment as a reference system. However, with this submittal, FDEP determined that it is more appropriate to use the Upper Loxahatchee segment as a reference system because of similar salinity values. In addition, the Southwest Fork and Upper Loxahatchee segments appear to be similar in physical structure (narrow and sinuous) compared to the Middle Loxahatchee segment that is more representative of an open water estuary system. The EPA finds that use of the Upper Loxahatchee as a reference system for the Southwest Fork is appropriate and approves the revised NNC for the Loxahatchee River Estuary (Southwest Fork) for all of the reasons contained in the EPA decision dated September 26, 2013. These NNC are, therefore, protective of the Loxahatchee River Estuary (Southwest Fork) designated use and the EPA approves this revised NNC.

(r) Lake Worth Lagoon

The Lake Worth Lagoon NNC were based on the reference period approach and were previously approved by the EPA.

(r) No change.

EPA Analysis

The NNC entry for the Lake Worth Lagoon is referenced here for completeness. This provision has not been revised; therefore, no further EPA review is necessary.

(s) Halifax River Estuary and Tomoka River Estuary

The Lower Halifax River Estuary, Upper Halifax River Estuary, and Tomoka Basin segment specific NNC were previously approved by the EPA. The Tomoka River Estuary segment is newly adopted, and all segments, except for the Lower Halifax River estuary segment are newly codified into this section of the State's regulations.

(s) Halifax River Estuary and Tomoka River Estuary	For estuary segments with criteria expressed as annual geometric means (AGM), the values shall not be exceeded more than once in a three year period. Criteria expressed as annual means are not to be exceeded in any year.		
1. Lower Halifax River Estuary	0.142 mg/L as AGM	0.72 mg/L as AGM	6.2 µg/L as AGM
2. Upper Halifax River Estuary	See subsection 62-304.435(5), F.A.C.[8]	See subsection 62-304.435(5), F.A.C.[8]	9.0 µg/L as annual mean
3. Tomoka River Estuary	0.132 mg/L as AGM	1.24 mg/L as AGM	7.2 µg/L as AGM
4. Tomoka Basin	0.105 mg/L as AGM	1.20 mg/L as AGM	7.1 µg/L as AGM

EPA Analysis

The EPA previously approved NNC for the Lower Halifax River Estuary in a decision dated September 26, 2013. In the current rulemaking, FDEP revised the title to 62-302.532(1)(s), and renumbered the Lower Halifax River Estuary provision, to reflect that NNC for the Tomoka River Estuary segments have been added to the subsection. FDEP also revised the introductory language in this subsection, clarifying which criteria are expressed as AGMs and which are expressed as annual means. The reorganization and clarifying statements are non-substantive revisions that do not change the magnitude, duration or frequency of Florida's EPA-approved water quality standards. The EPA approves these revisions as non-substantive changes that are consistent with the CWA and the EPA's implementing regulations. The EPA's approval of these revisions as non-substantive changes, does not re-open the EPA's prior approval of the underlying substantive water quality standards.

The EPA previously approved a TMDL and Hierarchy 1 NNC for TP and TN for the Upper Halifax River Estuary (Upper East Coast), as set out in the EPA's decision dated May 15, 2014. The EPA also previously approved the Governor's Report, which included NNC for chl *a* for the Upper Halifax River

[8] "The TMDL to address the nutrient impairment in the northern segment of Halifax River is an annual average total nitrogen (TN) and total phosphorus (TP) concentration of 1.13 mg/L and 0.185 mg/L, respectively."

Estuary, as set out in a decision dated September 26, 2013. In this rulemaking, FDEP has codified both the Hierarchy 1 NNC for TP and TN and the chl *a* criterion at 62-302.532(1)(s)2. The EPA approves these codifications as non-substantive changes that are consistent with the CWA and the EPA's implementing regulations. The EPA's approval of these codifications does not re-open the EPA's prior approval of the underlying substantive water quality standards.

FDEP established NNC for a new segment in the Tomoka River Estuary at 62-302.532(1)(s)3. This segment of the estuary is located in Volusia County at the confluence of the Tomoka and Halifax Rivers, with its natural headwaters originating in low-lying areas south of I-4 and west of I-95. The river flows generally north-northeast until its confluence with the Halifax River at the Tomoka Basin. NNC for the Tomoka River Estuary were developed using the general reference period approach outlined in the summary of approaches above. The derivation of these NNC is consistent with the reference period approach that was previously approved by the EPA and protects the designated use. Therefore, the revisions are approved by the EPA pursuant to CWA Section 303(c).

The EPA previously approved NNC for the Tomoka Basin in a decision dated September 26, 2013. In this rulemaking, FDEP has codified those NNC at 62-302.532(1)(s)4. The EPA approves this codification as a non-substantive change that is consistent with the CWA and the EPA's implementing regulations. The EPA's approval of this codification does not re-open the EPA's prior approval of the underlying substantive water quality standards.

(t) Guana River/Tolomato

The Guana River/Tolomato NNC were based on the reference period approach and were previously approved by the EPA. Pellicer Creek Estuary NNC were based on the modified reference period approach, and the resulting revision and codification are the subject of the EPA's current review.

(t) Guana River/Tolomato River/Matanzas River (GTM) Estuary	Criteria for all estuary segments are expressed as annual geometric mean values (AGM) not to be exceeded more than once in a three year period.		
1. through 3. No change.			
4. Pellicer Creek Estuary	0.123 mg/L as AGM	1.10 mg/L as AGM	4.3 µg/L as AGM

EPA Analysis

The EPA previously approved NNC for the first three segments of Guana River/Tolomato River/Matanzas River Estuary in a decision dated September 26, 2013. In the current rulemaking, FDEP made a revision to the introductory paragraph and added a fourth segment to 62-302.532(1)(t). The revision to the introductory language is a clarifying, non-substantive revision that does not change the magnitude, duration or frequency of Florida's EPA-approved water quality standards. The EPA approves this non-substantive change as consistent with the CWA and the EPA's implementing regulations. The EPA's approval of this revision does not re-open the EPA's prior approval of the underlying substantive water quality standards.

As a matter of further characterizing watersheds within the Guana River/Tolomato estuary, FDEP determined that Pellicer Creek Estuary qualified for the modified reference period approach due to minimal disturbance in the overall watershed. Watershed disturbance levels were based on the Land

Disturbance Index scores for each watershed. This technical approach sets NNC magnitudes expressed as an AGM at the 90% prediction interval of the AGM concentrations, rather than the 80% prediction interval (discussed in more detail above) for TP, TN and chl *a*. The EPA has determined this approach to be scientifically defensible for minimally disturbed watersheds and protective of the designated use and therefore, approves these NNC, including the codification of these NNC into this section.

(u) Nassau River Estuary

The Nassau River Estuary NNC were based on the distributional statistics approach and were previously approved by the EPA.

(u) No change.

EPA Analysis

The NNC entry for the Nassau River Estuary is referenced here for completeness. This provision has not been revised; therefore, no further EPA review is necessary.

(v) Suwannee, Waccasassa, and Withlacoochee River Estuaries

The Suwannee, Waccasassa, and Withlacoochee River Estuaries NNC were based on the distributional statistics approach and previously approved by the EPA.

(v) Suwannee, Waccasassa, and Withlacoochee River Estuaries	For estuary segments with criteria expressed as single value annual geometric means (AGM), the values shall not be exceeded more than once in a three year period. For estuary segments with criteria expressed as a salinity dependent equation, the annual nutrient criteria are expressed as annual geometric means applied to individual monitoring stations by solving the applicable equation below using the annual arithmetic average salinity (AASal) in practical salinity units (PSU) for the station. The AASal shall be calculated as the annual mean of the salinity measurements for each station made in conjunction with the collection of the nutrient samples. For criteria expressed as a salinity dependent ~~dependant~~ equation, no more than 10 percent of the monitoring stations within the segment shall exceed the limit (expressed as AGM) on an annual basis, more than once in a three year period.
1. through 3. No change.	

EPA Analysis

The EPA previously approved NNC for the Suwannee, Waccasassa, and Withlacoochee River Estuaries in a decision dated September 26, 2013. In this rulemaking, FDEP made an editorial correction in the introductory language. This revision is an editorial, non-substantive revision that does not change the magnitude, duration or frequency of Florida's EPA-approved water quality standards. The EPA approves this revision as consistent with the CWA and the EPA's implementing regulations. The EPA's approval of this revision as a non-substantive change, does not re-open the EPA's prior approval of the underlying substantive water quality standards.

(w) Springs Coast (Crystal River to Anclote River)

With the exception of Kings Bay, the Springs Coast (Crystal River to Anclote River) NNC were based on the reference period approach and were previously approved by the EPA. The history of NNC for the King's Bay segment is explained further below.

(w) Springs Coast (Crystal River to Anclote River)	For estuary segments with criteria expressed as annual geometric means (AGM), the values shall not be exceeded more than once in a three year period.		
1. through 15. No change.			
16. Anclote Bayou	0.063 mg/L as AGM	0.65 mg/L as AGM	3.8 µg/L as AGM
17. Kings Bay	See subsection 62-304.645(17), F.A.C.[9]	See subsection 62-304.645(17), F.A.C.[9]	5.7 µg/L as AGM

EPA Analysis

The EPA previously approved NNC for the first 15 segments within 62-302.532(1)(w) Springs Coast (Crystal River to Anclote River) in a decision dated September 26, 2013. FDEP is codifying the NNC for the Anclote Bayou segment into rule by this submittal, without revision, from the NNC values that were approved by the EPA on September 26, 2013. The EPA approves this codification as consistent with the CWA and the EPA's implementing regulations.

The EPA approved TP, TN, and chl *a* criteria for Kings Bay in a decision dated September 26, 2013. In this rulemaking, FDEP modified the TP and TN criteria based on the information contained in the Nutrient TMDL for Kings Bay (WBID 1341) dated June 2014 and modified the chl *a* criterion based on revised information. In a supplemental document, titled "Explanation of Changes from August Report," provided by the state on February 1, 2017, FDEP clarified:

> The NNC for Kings Bay were developed using the same basic methodologies for both the August 1 Report and the final adopted NNC. The TN and TP criteria were based on the Kings Bay TMDL (WBID 1341), while the chlorophyll *a* criterion was based on the reference period approach. However, there were some refinements made to the TMDL, which was still draft in August 1, 2013, that resulted in differences in both the magnitude and duration of the TN and TP criteria, and revisions to the calculation of the chlorophyll *a* criterion that resulted in difference in the magnitude of the chlorophyll *a* criterion. This document summarizes the changes that were made, and demonstrates that the revised (adopted) criteria are equally, if not more protective than the criteria in the August 1 Report.
>
> The minimal differences in magnitude between the August 1 Report TN and TP criteria for Kings Bay (0.033 mg/L for TP, and 0.29 mg/L for TN) and the adopted TN and TP criteria (0.032 for TP, and 0.28 mg/L for TN) were due to rounding errors that were discovered in the draft TMDL report. These errors were identified by TMDL staff, and are reflected in the final TMDL adopted in June 2014. There is also a difference in the duration/frequency of the NNC in the August 1 Report, which expressed the criteria as "long-term average not to be exceeded," compared to the duration/frequency in the Kings Bay TMDL, which expressed the criteria as "annual average, not to be exceeded in any year." This difference reflects a misunderstanding by the Standards Program of the draft TMDL during development of the August 1 Report. In the

[9] "Kings Bay. The nutrient TMDL is an annual arithmetic mean TN concentration of 0.28 mg/L and an annual arithmetic mean TP concentration of 0.032 mg/L . . ."

draft (and final) TMDL, the TN and TP criteria were derived based on relationships between TN concentrations and a "long-term annual average" nitrate target and between TP concentrations and a "long-term annual average orthophosphate target." However, the final TMDL document and the adopted TMDL rule language (Rule 62-304.645(17), F.A.C.) clearly express the TN and TP criteria as "annual averages" or the equivalent "annual arithmetic mean."

It should be noted that both the small changes in magnitude due to correction in rounding and the change in expression from "long-term average" to "annual average" make the criteria more protective.

As noted in the Technical Support Document for the NNC, the magnitude of the chlorophyll criterion decreased from the August 1 Report (8.4 µg/L) to the final adopted criterion (5.7 µg/L) because the criterion in the August 1 Report was based on uncorrected chlorophyll *a* data, while the final adopted criterion was based on corrected chlorophyll. The criterion in the August 1 Report was based on uncorrected chlorophyll *a* because most of the available chlorophyll data were uncorrected values. However, the Department generally prefers corrected chlorophyll because it is a better estimate of algal primary productivity (in fact, the Impaired Waters Rule (Chapter 62-303, F.A.C.), requires use of corrected chlorophyll data for 303(d) assessments), and the department realized that there were sufficient paired corrected and uncorrected data to transform uncorrected data to corrected values. For the correction, the department developed a system-specific relationship between the available corrected chlorophyll *a* values and paired uncorrected chlorophyll *a* values, and applied the relationship to the remaining uncorrected chlorophyll *a* data.

It should be noted that the corrected chlorophyll values were used for the chlorophyll screening that is part of the reference period approach, which slightly changed which years did not meet the chlorophyll a screen. However, as was the case for all of the NNC developed using the reference period approach, data from years that did not meet one of the applicable screens were excluded from the analysis, and as such, the resultant criteria are protective.

The TN and TP criteria for King's Bay incorporates by reference subsection 62-304.645(17), F.A.C. The EPA is acting on and approves the following cross-referenced language: "The nutrient TMDL is an annual arithmetic mean TN concentration of 0.28 mg/L and an annual arithmetic mean TP concentration of 0.032 mg/L . . ." In addition, the EPA is also approving the corresponding chl *a* criterion value of 5.7 µg/l as an annual geometric mean that is based on the reference period approach discussed above, with a correction factor applied to the uncorrected chl *a* data so that the criteria could be expressed as corrected chl *a*. This approach resulted in a lowering of the previously approved chl *a*. The EPA has determined that all of the technical approaches used to develop the H1 NNC administered through a TMDL for the parameters TN and TP and the corresponding derivation of the chl *a* are consistent with the reference period approach previously approved by the EPA and are protective of the designated use. This approach is consistent with the approach previously approved by the EPA on September 26, 2013, and is protective of the designated use and therefore, the EPA approves the revised chl *a* criterion and its codification into 62-302.532(w)17.

(x) Big Bend and Apalachee Bay

The entire section (x) has now been codified and some segments were revised from the previously approved criteria values. Segments 1 through 14 in the following section were previously based on the

use of a mechanistic model, and approved by the EPA. Segment 9 was also partially addressed in a H1 based on a WQBEL. In this rulemaking, the Big Bend and Apalachee Bay NNC were generally developed using either the reference period approach using segment wide daily values (90% prediction interval for Ochlocknee River Estuary, St. Marks Offshore, and Spring Warrior Offshore segments, or the 90th percentile nonparametric for Ochlockonee/Alligator Harbor Offshore, St. Marks River Estuary, Aucilla River Estuary, and the Aucilla Offshore segments), modeling different from the Big Bend model (Econfina River Estuary, Econfina Offshore, Fenholloway River Estuary, or Fenholloway Offshore) or the modified reference period approach for the Steinhatchee River Estuary, Steinhatchee Offshore, and Horseshoe Beach Offshore segments. Some deviations from this summary exist for some parameters where different amounts of data were available. Cedar Key is a codification of the criteria included in the Governor's Report, which was developed using the original model, and not otherwise revised from the criteria which were approved on September 26, 2013. A complete summary of the approaches used for segments 1 through 14, by parameter, is included in Table 4.4t. of the State's 2015 TSD.

(x) Big Bend and Apalachee Bay	For bay segments with criteria expressed as annual geometric means (AGM), the values shall not be exceeded more than once in a three year period. For all other bay segments, the criteria shall not be exceeded in more than 10 percent of the measurements and shall be assessed over the most recent seven year period. Nutrient and nutrient response values do not apply to tidally influenced areas that fluctuate between predominantly marine and predominantly fresh waters during typical climatic and hydrologic conditions.		
1. Ochlockonee River Estuary	0.067 mg/L	0.86 mg/L	9.2 µg/L
2. Ochlockonee/Alligator Harbor Offshore	0.032 mg/L	0.57 mg/L	8.2 µg/L
3. St. Marks River Estuary	0.044 mg/L	0.70 mg/L	6.0 µg/L
4. St. Marks Offshore (includes Oyster and Dickerson Bays)	0.045 mg/L	0.63 mg/L	8.0 µg/L
5. Aucilla River Estuary	0.080 mg/L	0.89 mg/L	2.2 µg/L
6. Aucilla Offshore	0.025 mg/L	0.60 mg/L	9.5 µg/L
7. Econfina River Estuary	0.101 mg/L as AGM	1.14 mg/L as AGM	4.9 µg/L as AGM
8. Econfina Offshore	0.042 mg/L as AGM	0.65 mg/L as AGM	3.7 µg/L as AGM
9. Fenholloway River Estuary	839 lbs/day, as an annual average, based on Level II WQBEL	5,573 lbs/day, as an annual average, based on Level II WQBEL	4.6 µg/L as AGM
10. Fenholloway Offshore	0.059 mg/L as AGM	0.68 mg/L as AGM	4.1 µg/L as AGM
11. Spring Warrior Offshore	0.047 mg/L	0.67 mg/L	8.3 µg/L
12. Steinhatchee River Estuary	0.062 mg/L as AGM	0.86 mg/L as AGM	3.9 µg/L as AGM
13. Steinhatchee Offshore	0.021 mg/L as AGM	0.45 mg/L as AGM	3.3 µg/L as AGM
14. Horseshoe Beach Offshore	0.021 mg/L as AGM	0.45 mg/L as AGM	3.3 µg/L as AGM
15. Cedar Key	0.060 mg/L as AGM	0.79 mg/L as AGM	10.9 µg/L as AGM

EPA Analysis

The EPA previously approved NNC for 15 segments in the Big Bend and Apalachee Bay area in a decision dated September 26, 2013. In this rulemaking, FDEP has developed introductory paragraph language for the newly added area into regulation, revised the NNC associated with segments 1 through 14 and codified NNC for all 15 segments into rule at 62-302.532(1)(x). Upon further review, FDEP concluded that the EPA-developed Apalachee Bay/Big Bend area hydrodynamic/water quality model was not adequately calibrated to serve as the basis for NNC for the entire Big Bend area. The revised

NNC were based on monitoring data from the IWR Run 49 and various other data from multiple sources including Project COAST, Barry Vittor and Associates, Florida Wildlife Research Institute, etc. The EPA's conclusions regarding the addition of the most recent seven year period language in the introductory paragraph is discussed starting on page 13, in the section titled "Consideration of the 'Years of Data' Language Contained in Estuary Introductory Paragraphs." The remaining introductory language was added in 62-532(1)(x) Big Bend and Apalachee Bay to define the duration and frequency for the associated criteria values contained in the table. This language is consistent with other entries in this section that have previously been approved by the EPA and since they were determined to be scientifically defensible and protective of the designated use are, therefore, approved.

With this submittal, FDEP developed revised NNC using the reference period approach for the following segments in the Big Bend and Apalachee Bay: 1. Ochlockonee River Estuary; 2. Ochlockonee/Alligator Harbor Offshore; 3. St. Marks Estuary; and 4. St. Marks River Offshore. As a matter of further characterizing watersheds within the Big Bend and Apalachee Bay area, FDEP determined that 5. Aucilla River Estuary; 6. Aucilla Offshore; 11. Spring Warrior Offshore; 12. Steinhatchee River Estuary and 13. Steinhatchee Offshore qualified for the modified reference period approach due to minimal disturbance in the overall watershed. Watershed disturbance levels were based on the Land Disturbance Index scores for each watershed. This technical approach sets NNC magnitudes expressed as an AGM at the 90% prediction interval of the AGM concentrations, rather than the 80% prediction interval (discussed in more detail above). Although Aucilla River Estuary, Aucilla Offshore, and Spring Warrior Offshore segments were considered to be qualified for the modified reference period approach, there was insufficient data to calculate the AGMs used in that approach. In the end, only the two Steinhatchee segments directly used the modified reference period approach in this area of the state.[10]

FDEP set the revised water quality criteria for the Big Bend and Apalachee Bay: 1. Ochlockonee River Estuary; 2. Ochlockonee/Alligator Harbor Offshore; 3. St. Marks River Estuary; and 4. St. Marks Offshore.; 5. Aucilla River Estuary; 6. Aucilla Offshore; and 11. Spring Warrior Offshore at values that shall not be exceeded in more than 10 percent of the measurements because there were insufficient years of data available that passed all screens. FDEP-developed NNC were calculated at the 90th percent prediction interval (90th percentile if fewer than 20 sampling dates) of data from all years that passed screens for these segments. In addition, Oyster and Dickerson Bays were merged into the St. Marks Offshore segment, because data were limited in those segments and the existing data showed high comparability among the two bays and the St. Marks Offshore segment. This approach is consistent with those previously approved by the EPA and is protective of the designated use and therefore, approves these NNC, including the codification of these NNC into this section.

For the 7. Econfina River, 8. Econfina Offshore, and 10. Fenholloway Offshore segments, FDEP used a three-dimensional time variable hydrodynamic/water quality model to set revised NNC. This model was previously used in the EPA approved Fenholloway WQBEL for the Buckeye discharge. The model was calibrated against a comprehensive 2012 water quality dataset and its performance was verified by a 16-year simulation (1998-2013). Model simulation encompassed a range of low and high flow years that occurred in long term flow records for both rivers. The chl *a* screen was conducted against data produced for the 16 model years, with the screen passing all years for both segments. The model generated a distribution of possible AGMs for TP, TN, and chl *a* given the sampling frequency and number of sites of a typical ambient monitoring program. Criteria were calculated as the 90th percentile

[10] Horseshoe Beach Offshore uses the adjacent Steinhatchee Offshore segment as a reference waterbody, and therefore, the criteria for Horseshoe Beach Offshore are based on the same modified reference approach values.

of the predicted 80th percentiles (e.g. upper 90% confidence interval of the predicted 80th percentile) which FDEP determined was more representative of the data distribution than the available empirical data. This approach is consistent with the approach previously approved by the EPA for the Fenholloway River Estuary Hierarchy 1 criteria for TN and TP and is protective of the designated use and therefore, the EPA approves these NNC, including the codification of these NNC into this section.

The EPA previously approved the TN and TP NNC for Fenholloway River Estuary in a decision dated March 6, 2014. In this rulemaking, FDEP is codifying the TP and TN criteria, as well as codifying the revised chl *a* criterion at 62-302.532(1)(x)9. FDEP used a three-dimensional time variable hydrodynamic/water quality model to revise the chl *a* NNC because the model which had been developed to establish the WQBELs for the Buckeye discharge was calibrated against a comprehensive water quality dataset and verified by a 16 year simulation that encompassed a wide range of flow conditions. This comprehensive simulation showed that model results were actually more representative of the data distribution than the available empirical data. To develop the chl *a* NNC using the model, the output was compared to the biological screens used for the reference approach. Years passing the screens were used to calculate the NNC, with the exception of years that exceeded the nonpoint source loads allowed under the Fenholloway TMDL. Rather than use all model output for years passing the biological screens, FDEP worked with Buckeye's consultants to develop a method that randomly selected values from the model output at a frequency and number of sites consistent with a typical ambient monitoring program, and the chl *a* criterion was set at the upper 90% confidence interval of the predicted 80th percentile. The approach for chl *a* was determined to be protective of the designated use and therefore, the EPA approves these NNC, including the codification of these NNC into this section.

Using the modified reference period approach, FDEP revised the NNC for two segments, 12. Steinhatchee River Estuary and 13. Steinhatchee Offshore. This approach was used due to minimal disturbance in the overall watershed. Watershed disturbance levels were based on the Land Disturbance Index scores for each watershed. This technical approach sets NNC magnitudes expressed as an AGM at the 90% prediction interval of the AGM concentrations, rather than the 80% prediction interval (discussed in more detail above) for TP, TN and chl *a*. The EPA has determined this approach to be scientifically defensible for minimally disturbed watersheds and protective of the designated use and therefore, the EPA approves these NNC, including the codification of these NNC into this section.

FDEP used the reference estuary approach for the 14. Horseshoe Beach Offshore segment using the adjacent Steinhatchee Offshore segment due to the nonattainment of biological endpoints. The use of reference waterbodies has been previously approved by the EPA and is protective of the designated use and therefore, the EPA approves these NNC, including the codification of these NNC into this section.

Lastly, for the Cedar Key NNC, the EPA previously approved this provision in a decision dated September 26, 2013. In this rulemaking, FDEP codified this provision. The EPA approves this codification that is consistent with the CWA and the EPA's implementing regulations.

(y) Intracoastal Waterway (ICWW)

The Intracoastal Waterway (ICWW) NNC were developed using the reference period approach, the reference waterbody approach, and the reference using segment wide daily value approach. The entire section (y) has now been codified and some segments were revised from the previously approved criteria values.

(y) Intracoastal Waterway (ICWW)	For ICWW segments with criteria expressed as annual geometric means (AGM), the values shall not be exceeded more than once in a three year period. Criteria expressed as kg/year and annual means are not to be exceeded in any year. For all other ICWW segments, the criteria shall not be exceeded in more than 10 percent of the measurements and shall be assessed over the most recent seven year period.		
1. Gulf ICWW between Choctawhatchee Bay and St. Andrew Bay	0.108 mg/L	1.13 mg/L	6.6 µg/L
2. Gulf ICWW between St. Andrew Bay and St. Joseph Bay	0.108 mg/L	1.13 mg/L	6.6 µg/L
3. ICWW between Roberts Bay and Lemon Bay	0.253 mg/L as AGM	0.59 mg/L as AGM	4.0 µg/L as AGM
4. Central Broward County ICWW	0.045 mg/L as AGM	0.80 mg/L as AGM	2.7 µg/L as AGM
5. North Broward County ICWW	0.059 mg/L as AGM	0.79 mg/L as AGM	3.0 µg/L as AGM
6. North Central Broward County ICWW	0.048 mg/L as AGM	0.88 mg/L as AGM	3.3 µg/L as AGM
7. South Broward County ICWW	0.043 mg/L as AGM	0.70 mg/L as AGM	2.0 µg/L as AGM
8. Palm Beach County ICWW	0.146 mg/L	1.17 mg/L	13.4 µg/L
9. ICWW between North Lake Worth Lagoon and Lower Loxahatchee River	0.035 mg/L as AGM	0.66 mg/L as AGM	4.7 µg/L as AGM
10. ICWW Palm Coast	73,142 kg/year	798,913 kg/year	4.5 µg/L as annual mean
11. ICWW from North Tolomato River to St. Johns River	0.191 mg/L as AGM	1.27 mg/L	10.2 µg/L

EPA Analysis

The EPA previously approved NNC for 11 segments in the Intracoastal Waterway (ICWW) area in a decision dated September 26, 2013. In this rulemaking, FDEP has developed introductory paragraph language for the newly added area into regulation, revised the NNC for most of the segments, and codified NNC for all 11 segments into rule at 62-302.532(1)(y). The EPA's conclusions regarding the addition of the most recent seven year period language in the introductory paragraph is discussed starting on page 13, in the section titled "Consideration of the 'Years of Data' Language Contained in Estuary Introductory Paragraphs." The remaining introductory language was added in 62-532(1)(y) Intracoastal Waterway (ICWW) to define the duration and frequency for the associated criteria values contained in the table. This language is consistent with other entries in this section that have previously been approved by the EPA and since they were determined to be scientifically defensible and protective of the designated use are, therefore, approved.

The EPA previously approved NNC for Gulf ICWW between Choctawhatchee Bay and St. Andrew Bay, Gulf ICWW between St. Andrew Bay and St. Joseph Bay, and ICWW between Roberts Bay and Lemon Bay for all three parameters, a chl *a* criterion Central Broward County ICWW, and a TP criterion for ICWW from North Tolomato River to St. Johns River in a decision dated September 26, 2013. In this rulemaking, FDEP is codifying the corresponding NNC for these segments into rule by this submittal with a minor revision to the TN magnitude value from 1.14 mg/l to 1.13 mg/l, for segments 1 and 2, because of a typographical error in the Governor's Report. The following response from FDEP provides additional explanation of the typographical error:

> There were errors in the Governor's Report NNC table for the Gulf ICWW between St. Andrew Bay and St. Joseph Bay. The TN criterion listed in the Governor's Report was calculated based on data that had not been screened for biological targets, and the wrong value was entered into the table. Additionally, the wrong sample size was entered into the table. The correct number of TN samples was 31, not 38 as was originally reported. The error was corrected in the January 2015 report, and the final criteria were calculated based on a fully screened dataset using only years that passed the biological targets.

The EPA approves these revisions due to codification and the correction of the typographical error as consistent with the CWA and the EPA's implementing regulations.

The EPA previously approved TP and TN criteria for Central Broward County, TP, TN, and chl *a* criteria for North Broward County ICWW, North Central Broward County ICWW, South Broward County ICWW, Palm Beach County ICWW, and ICWW between North Lake Worth Lagoon and Lower Loxahatchee River, and TN and chl *a* criteria for ICWW from North Tolomato River to St. Johns River in a decision dated September 26, 2013. In this rulemaking, FDEP revised the NNC for these segments using the reference period approach with an updated data set as a result of increased data availability, in the case of segments 9. and 11., or a reduction in the data availability due to a revision to the biological endpoint screen methodology from the previously approved interim Governor's Report NNC. The reduction in data availability was done to make the derivation of criteria for segments 4., 5., 6., 7., and 8. consistent with the screening done in all other regions using the reference period approach. The NNC derived with this submittal only used data from years that passed both the chl *a* and DO screen, rather than the DO screen alone, which was used previously for these segments. The scientific basis for this NNC is presented on pages 100-117 of the TSD submitted with this request for changes to water quality standards. The derivation of these revised NNC is consistent with the reference period approach that was previously approved by the EPA and is protective of the designated use of the ICWW segments.

The EPA previously approved NNC for ICWW Palm Coast in a decision dated September 26, 2013. In this rulemaking, FDEP is codifying the previously EPA-approved chl *a* criterion and revising the TP and TN loads. The scientific basis for this NNC is presented on pages 182-183 of the TSD and was further clarified in the state's supplemental document provided to the EPA on February 1, 2017. In the February 1, 2017 clarification document, the state noted that:

> …[T]he allowable TN and TP loads increased significantly between the August 1 Report and the final NNC adopted in 2014 because the department corrected a math error resulting from the use of an incorrect ratio for calculating the nonpoint loads from the adjacent WBIDs in the August 1 Report. Also, the department determined one additional minor discrepancy between the August 1 report and the final NNC adopted in 2014 based on incorrect acreage for the three WBIDs.
> …
> [I]t should be noted that the acreage and total loadings for WBID 2363DA are consistent with the loadings and acreage for WBID 2363D from the Palm Coast TMDL (see Tables 4.1 and 6.1 of the July 2013 TMDL).
> …
> While these values are higher than in the August 1 Report, they are still protective because they are consistent with the methodology used in the previously approved August 1 Report and apply the reductions in nonpoint source loads that were required for WBID 2363D to attain water quality standards to the adjacent land areas….

The derivation of the revised TP and TN criteria is consistent with the previously EPA-approved NNC and is protective of the designated use of the ICWW segments. The EPA approves the codification of the chl *a* criterion as consistent with the CWA and the EPA's implementing regulations.

(z) St. Lucie Estuary

The TP and TN criteria for the first five segments of St. Lucie Estuary section were developed based on a TMDL. The chl *a* criteria were based on a ratio between long term average chl *a* in St. Lucie and the South Indian River Lagoon. The NNC for Manatee Creek were based on use of the St. Lucie Estuary segment as a reference waterbody. The entire section (z) has now been codified and some segments were revised from the previously approved criteria values.

(z) St. Lucie Estuary	For estuary segments with criteria expressed as annual geometric means (AGM), the values shall not be exceeded more than once in a three year period. For criteria expressed as long-term averages, the long-term average shall be based on data from the most recent seven-year period and shall not be exceeded.

1. St. Lucie Estuary	See subsection 62-304.705 (1), F.A.C.[11]	See subsection 62-304.705 (1), F.A.C.[11]	5.9 µg/L as AGM
2. Upper North Fork St. Lucie River	See subsection 62-304.705 (2), F.A.C.[12]	See subsection 62-304.705 (2), F.A.C.[12]	6.7 µg/L as AGM
3. Lower North Fork St. Lucie River	See subsection 62-304.705 (3), F.A.C.[13]	See subsection 62-304.705 (3), F.A.C.[13]	7.4 µg/L as AGM
4. Lower South Fork St. Lucie River	See subsection 62-304.705 (6), F.A.C.[14]	See subsection 62-304.705 (6), F.A.C.[14]	6.7 µg/L as AGM
5. Upper South Fork St. Lucie River	See subsection 62-304.705 (7), F.A.C.[15]	See subsection 62-304.705 (7), F.A.C.[15]	5.0 µg/L as AGM
6. Manatee Creek	0.081 mg/L as long-term average	0.72 mg/L as long-term average	5.9 µg/L as AGM

EPA Analysis

The NNC for these six segments were approved in decisions dated July 3, 2013, and September 26, 2013. In this rulemaking, FDEP is codifying TP and TN criteria for all six segments, as well as codifying revised chl *a* criteria for all six segments, at 62-302.532(1)(z). FDEP has also developed introductory paragraph language for the newly added area into regulation, which defines the duration and frequency for the associated criteria values contained in the table. The EPA's conclusions regarding the addition of the most recent seven year period language in the introductory paragraph is discussed starting on page 13, in the section titled "Consideration of the 'Years of Data' Language Contained in

[11] "(1) St. Lucie Estuary (Lower & Middle Estuary) WBID 3193: The Total Maximum Daily Loads (TMDLs) for the St. Lucie Estuary, based on data in the period from 1996 through 2005, are to achieve 0.081 mg/L total phosphorus and 0.72 mg/L total nitrogen at Roosevelt Bridge."
[12] "(2) North Fork St. Lucie River (Freshwater) WBID 3194: The TMDLs for the North St. Lucie (Freshwater) are to achieve 0.081 mg/L total phosphorus, 0.72 mg/L total nitrogen, and 2.0 mg/L biological oxygen demand for this segment."
[13] "(3) North Fork St. Lucie Estuary (Estuarine North Fork) WBID 3194B: The TMDLs for the North Fork St. Lucie Estuary (Estuarine North Fork) are to achieve 0.081 mg/L total phosphorus and 0.72 mg/L total nitrogen in this estuary segment."
[14] "(6) South Fork St. Lucie Estuary WBID 3210: The TMDLs for the South Fork St. Lucie Estuary are to achieve 0.081 mg/L total phosphorus and 0.72 mg/L total nitrogen in this estuary segment."
[15] "(7) South Fork St. Lucie River WBID 3210A: The TMDLs for the South Fork St. Lucie River are to achieve 0.081 mg/L total phosphorus and 0.72 mg/L total nitrogen in this river segment."

Estuary Introductory Paragraphs." The remaining introductory language is consistent with other entries in this section that have previously been approved by the EPA, and since they were determined to be scientifically defensible and protective of the designated use are, therefore, approved.

The TN and TP criteria for all of the segments listed above, except Manatee Creek, incorporate by reference subsection 62-304.705(1), (2), (3), (6), (7), F.A.C. The EPA is acting on and approves the following cross-referenced language: "(1) St. Lucie Estuary (Lower & Middle Estuary) WBID 3193: The Total Maximum Daily Loads (TMDLs) for the St. Lucie Estuary, based on data in the period from 1996 through 2005, are to achieve 0.081 mg/L total phosphorus and 0.72 mg/L total nitrogen . . ."; "(2) North Fork St. Lucie River (Freshwater) WBID 3194: The TMDLs for the North St. Lucie (Freshwater) are to achieve 0.081 mg/L total phosphorus, 0.72 mg/L total nitrogen, and 2.0 mg/L biological oxygen demand for this segment. Based on data in the period from 1996 to 2005, the cumulative load from all sources is 140,134 lbs/year total nitrogen, 15,765 lbs/year total phosphorus . . ."; "(3) North Fork St. Lucie Estuary (Estuarine North Fork) WBID 3194B: The TMDLs for the North Fork St. Lucie Estuary (Estuarine North Fork) are to achieve 0.081 mg/L total phosphorus and 0.72 mg/L total nitrogen in this estuary segment. Based on data in the period from 1996 to 2005, the cumulative load from all sources is 103,174 lbs/year total nitrogen and 11,672 lbs/year total phosphorus . . .," "(6) South Fork St. Lucie Estuary WBID 3210: The TMDLs for the South Fork St. Lucie Estuary are to achieve 0.081 mg/L total phosphorus and 0.72 mg/L total nitrogen in this estuary segment. Based on data in the period from 1996 through 2005, the cumulative load from all sources is 24,463 lbs/year total nitrogen and 2,752 lbs/year total phosphorus . . .," and "(7) South Fork St. Lucie River WBID 3210A: The TMDLs for the South Fork St. Lucie River are to achieve 0.081 mg/L total phosphorus and 0.72 mg/L total nitrogen in this river segment. Based on data in the period from 1996 through 2005, the cumulative load from all sources is 90,471 lbs/year total nitrogen and 10,178 lbs/year total phosphorus . . ." as well as the TN and TP NNC for Manatee Creek listed above.

The chl *a* magnitude and duration values for all of the segments in this provision have been revised with this submittal to be expressed as AGMs not to be exceeded one in three years, rather than long-term averages. The chl *a* criterion of 4.7 µg/l for the South Indian River Lagoon (IRL) was applied to the St. Lucie Estuary segments with the endpoint of seagrass protection. A calculation for the expected chl *a* value for each WBID was completed for the corresponding nutrient loading values assigned to the St. Lucie and IRL watersheds. Chl *a* criteria were calculated using the ratios of the AGMs between the St. Lucie segments and South IRL for each year and then the chl *a* criterion for each St. Lucie segment was calculated by multiplying the segment-specific 25th percentile of the annual AGM ratios by the South IRL chl *a*. The chl *a* criteria for Manatee Creek was set using the St. Lucie Estuary as a reference waterbody. The method in which the chl *a* NNC were calculated to protect seagrass growth and propagation in the South IRL will also protect seagrass beds in the St. Lucie. As previously explained, the EPA has found the use of seagrass beds as an endpoint is a scientifically defensible approach for the development of estuarine NNC that provide protection of the designated use, and therefore approves all chl *a* values for the St. Lucie Estuary section listed above.

(aa) Indian River Lagoon, Banana River Lagoon, and Mosquito Lagoon

The Indian River Lagoon, Banana River Lagoon, and Mosquito Lagoon NNC were developed using the reference period and reference water/site approaches, as well as existing TMDL work for some segments. The entire section (aa) has now been codified and some segments were revised from the previously approved criteria values.

	For estuary segments with criteria expressed as annual geometric means (AGM), the values shall not be exceeded more than once in a three year period. For all other estuary segments, the criteria shall not be exceeded in more than 10 percent of the measurements and shall be assessed over the most recent seven year period.		
1. Indian River Lagoon between Loxahatchee River up to and including Hobe Sound	0.021 mg/L as AGM	0.49 mg/L as AGM	2.0 µg/L as AGM
2. Indian River Lagoon between Hobe Sound and St. Lucie	0.060 mg/L as AGM	0.63 mg/L as AGM	6.9 µg/L
3. Indian River Lagoon from St. Lucie Estuary to Ft. Pierce Inlet	0.070 mg/L as AGM	0.72 mg/L as AGM	4.7 µg/L as AGM
4. Indian River Lagoon from Ft. Pierce Inlet to Indian River County Line	0.070 mg/L as AGM	0.72 mg/L as AGM	4.7 µg/L as AGM
5. Central Indian River Lagoon	See subsections 62-304.520(7) and (8), F.A.C.[16]	See subsections 62-304.520(7) and (8), F.A.C.[16]	5.9 µg/L as AGM
6. North Indian River Lagoon	See subsections 62-304.520(3) - (6), F.A.C.[17]	See subsections 62-304.520(3) - (6), F.A.C.[17]	6.4 µg/L as AGM
7. Sebastian River Estuary	63,991 pounds/year, not to be exceeded in any year	323,382 pounds/year, not to be exceeded in any year	5.9 µg/L as AGM
8. Banana River Lagoon	See subsections 62-304.520(9) and (10), F.A.C.[18]	See subsections 62-304.520(9) and (10), F.A.C.[18]	7.3 µg/L as AGM
9. Newfound Harbor	See subsection 62-304.520(11), F.A.C.[19]	See subsection 62-304.520(11), F.A.C.[19]	7.3 µg/L as AGM
10. Sykes Creek Estuary	See subsection 62-304.520(13), F.A.C.[20]	See subsection 62-304.520(13), F.A.C.[20]	7.3 µg/L as AGM
11. Mosquito Lagoon: Oak Hill to the Southern Terminus	0.034 mg/L as AGM	1.14 mg/L as AGM	2.5 µg/L as AGM
12. Mosquito Lagoon:	0.048 mg/L as AGM	0.65 mg/L as AGM	3.4 µg/L as AGM

[16] "(7) Indian River above Sebastian Inlet and the northern South Indian River: The TMDLs for the Indian River above Sebastian Inlet and the northern South Indian River are 684,715 lb/year of total nitrogen and 111,594 lb/year of total phosphorus, . . ." "(8) Central and southern South Indian River: The TMDLs for the Central and southern South Indian River are 278,273 lb/year of total nitrogen and 53,599 lb/year of total phosphorus, . . ."

[17] "(3) Indian River above Max Brewer Causeway: The Total Maximum Daily Loads (TMDLs) for the Indian River above Max Brewer Causeway are 177,220 lb/year of total nitrogen and 9,320 lb/year of total phosphorus, . . ." "(4) Indian River above NASA Causeway: The TMDLs for the Indian River above NASA Causeway are 173,232 lb/year of total nitrogen and 14,793 lb/year of total phosphorus, . . ." "(5) Indian River above 520 Causeway: The TMDLs for the Indian River above 520 Causeway are 147,524 lb/year of total nitrogen and 11,845 lb/year of total phosphorus, . . ." "(6) Indian River above Melbourne Causeway: The TMDLs for the Indian River above Melbourne Causeway are 189,068 lb/year of total nitrogen and 20,592 lb/year of total phosphorus, . . ."

[18] "(9) Banana River above Barge Canal: The TMDLs for the Banana River above Barge Canal are 116,314 lb/year of total nitrogen and 7,825 lb/year of total phosphorus," "(10) Banana River below 520 Causeway and Banana River above 520 Causeway: The TMDLs for the Banana River below 520 Causeway and Banana River above 520 Causeway are 144,780 lb/year of total nitrogen and 12,181 lb/year of total phosphorus, and are allocated as follows"

[19] "(11) Newfound Harbor: The TMDLs for Newfound Harbor are 30,661 lb/year of total nitrogen and 3,247 lb/year of total phosphorus, and are allocated as follows"

[20] "(13) Sykes Creek: The nutrient TMDL for Sykes Creek is 30,030 lb/year of total nitrogen and 3,174 lb/year of total phosphorus and is allocated as follows"

Edgewater to Oak Hill			
13. Mosquito Lagoon: Ponce de Leon to Edgewater	0.049 mg/L as AGM	0.51 mg/L as AGM	4.0 µg/L as AGM

EPA Analysis

FDEP has revised many of the NNC for these segments and codified the revised and unrevised NNC into rule by this action. FDEP also added a title and introductory language for Indian River Lagoon, Banana River Lagoon, and Mosquito Lagoon established at 62-302.532(1)(aa), which defines the duration and frequency for the associated criteria values contained in the table. The EPA's conclusions regarding the addition of the most recent seven year period language in the introductory paragraph is discussed starting on page 13, in the section titled "Consideration of the 'Years of Data' Language Contained in Estuary Introductory Paragraphs." The remaining introductory language is consistent with other entries in this section that have previously been approved by the EPA and since they were determined to be scientifically defensible and protective of the designated use are, therefore, approved.

In a decision dated September 26, 2013, the EPA approved NNC for the Indian River Lagoon between Loxahatchee River up to and including Hobe Sound; Indian River Lagoon between Hobe Sound and St. Lucie; and Indian River Lagoon from St. Lucie Estuary to Indian River County Line (which has now been adopted as two segments: Indian River Lagoon from St. Lucie Estuary to Ft. Pierce Inlet and Indian River Lagoon from Ft. Pierce Inlet to Indian River County Line in the South IRL). The original three segments were based on the reference period approach. With this rulemaking, FDEP revised the NNC to include four segments, three which were developed using the reference period approach (segments 1. through 3.) and one which was developed using the reference system approach (segment 4.) previously described in this decision document. The South IRL NNC contained in this submittal are different from the previously approved NNC due to re-segmentation based on water quality, location of tidal nodes, WBID lines, and previous work done by the South Florida Water Management District. Under the previous approval, results of biological screens (the depth to seagrass screen) were not considered; therefore, there were fewer years of data for criteria calculations in the derivation of the revised criteria once the depth to seagrass screen was applied. In this submittal, FDEP used the depth to seagrass target developed by the South Florida Water Management District for these segments by determining the average mean edge of bed depth to be 1.3 meters based on the lower bound of the 95% confidence interval and set this as the benchmark depth seagrass target. The depth to seagrass target of 1.3 meters translates to a SD target of 1.16 meters. FDEP proposed the criteria developed for the IRL from Ft. Pierce Inlet to the St. Lucie Estuary be applied to the IRL from the IRL County Line to Ft. Pierce Inlet segment. For chl *a* FDEP derived a system-specific relationship between corrected and uncorrected chl *a* based on all paired results from that system during the period 1990-2005 and used that relationship to transform uncorrected chlorophyll results to corrected. As previously explained, the EPA has found the use of seagrass beds as an endpoint and the reference period approach scientifically defensible approaches for the development of estuarine NNC that provide protection of the designated use. The EPA therefore, approves TP, TN, and chl *a* criteria for the Indian River Lagoon segments 1. through 4.

The EPA previously approved TN and TP criteria for Central Indian River Lagoon, North Indian River Lagoon, Banana River Lagoon, Newfound Harbor, and Sykes Creek Estuary, in a decision dated September 26, 2013. In this rulemaking, FDEP has incorporated by reference subsection, 62-304.520(3)

through (11) and (13), F.A.C. The EPA is acting on and approves the following cross-referenced 62-304 language, which is being codified into 62-302: "(3) Indian River above Max Brewer Causeway: The Total Maximum Daily Loads (TMDLs) for the Indian River above Max Brewer Causeway are 177,220 lb/year of total nitrogen and 9,320 lb/year of total phosphorus, . . .," "(4) Indian River above NASA Causeway: The TMDLs for the Indian River above NASA Causeway are 173,232 lb/year of total nitrogen and 14,793 lb/year of total phosphorus, . . .," "(5) Indian River above 520 Causeway: The TMDLs for the Indian River above 520 Causeway are 147,524 lb/year of total nitrogen and 11,845 lb/year of total phosphorus, . . .," "(6) Indian River above Melbourne Causeway: The TMDLs for the Indian River above Melbourne Causeway are 189,068 lb/year of total nitrogen and 20,592 lb/year of total phosphorus, . . .," "(7) Indian River above Sebastian Inlet and the northern South Indian River: The TMDLs for the Indian River above Sebastian Inlet and the northern South Indian River are 684,715 lb/year of total nitrogen and 111,594 lb/year of total phosphorus, . . .," "(8) Central and southern South Indian River: The TMDLs for the Central and southern South Indian River are 278,273 lb/year of total nitrogen and 53,599 lb/year of total phosphorus, . . .," "(9) Banana River above Barge Canal: The TMDLs for the Banana River above Barge Canal are 116,314 lb/year of total nitrogen and 7,825 lb/year of total phosphorus," "(10) Banana River below 520 Causeway and Banana River above 520 Causeway: The TMDLs for the Banana River below 520 Causeway and Banana River above 520 Causeway are 144,780 lb/year of total nitrogen and 12,181 lb/year of total phosphorus, and are allocated as follows," "(11) Newfound Harbor: The TMDLs for Newfound Harbor are 30,661 lb/year of total nitrogen and 3,247 lb/year of total phosphorus, and are allocated as follows," "(13) Sykes Creek: The nutrient TMDL for Sykes Creek is 30,030 lb/year of total nitrogen and 3,174 lb/year of total phosphorus and is allocated as follows." For North and Central IRL segments (segments 5. and 6.), FDEP derived chl *a* using the reference period approach derived in the same manner as the previously approved Governor's Report protective values. With this submittal, FDEP has used updated data that resulted in revised NNC. The EPA approves these revised values for segments 5. and 6., using more recent data, for all of the reasons stated in the September 26, 2013, decision. For Newfound Harbor and Sykes Creek (segments 9. and 10.) chl *a* values, FDEP used the protective Banana River Lagoon (segment 8.) chl *a* criterion developed using the reference period approach using data only from years when the biological targets were met. As stated previously, the EPA finds the reference period approach scientifically defensible and approves the chl *a* values developed for segments 8. through 10., for all the reasons stated in the September 26, 2013, decision.

The EPA previously approved TP and TN criteria for the Sebastian River Estuary segment, which were based on areal nutrient loading limits established for the Central IRL, as lbs/acre/year as an annual average not to be exceeded, and calculated the allowable TN and TP load based on the watershed acreage to establish loading limits that could serve as the applicable NNC for the estuary. For chl *a*, FDEP established NNC to protect seagrass in the downstream Central IRL, since seagrass is not typically present in the Sebastian River. In this rulemaking, FDEP codified the TP and TN criteria into 62-302.532(1)(aa), as well as revised the chl *a* criterion to reflect the downstream chl *a* criterion for Central IRL that changed during this recent rulemaking effort. The EPA finds the approach of protecting downstream segments scientifically defensible and approves the chl *a* criterion for this segment. The EPA also approves the codification of the TP and TN criteria into 62-302.532(1)(aa).

For Mosquito Lagoon: Oak Hill to the Southern Terminus; Mosquito Lagoon: Edgewater to Oak Hill; and Mosquito Lagoon: Ponce de Leon to Edgewater, FDEP has revised the method used to derive the NNC in the previously approved Governor's Report based NNC which were approved in a decision dated September 26, 2013. FDEP revised the NNC for the Mosquito Lagoon segments to make them more consistent with NNC established for other estuaries. The revised NNC are expressed as AGMs not

to be exceeded more than once in a three year period. The AGM was calculated by translating the previously approved five-year rolling average into an equivalent AGM expression. The revised criteria were developed to be consistent with criteria published in the Governor's Report, to maintain the five-year reference period from 2004 to 2008, and to incorporate the long-term variability expected around the geometric mean of the reference period. The mathematical adjustment resulted in criteria that were, in this case, consistent with the protectiveness provided by the previous criteria. In the future, however, the EPA does not recommend that FDEP translate criteria from one method to another. Instead it would be more appropriate to use the established and agreed upon methods for numeric nutrient criteria derivation from the beginning of the criteria derivation process. However, since this particular case was determined to be equivalent to the previously approved NNC, the EPA approves the revised NNC established for these three segments.

(bb) Lower St. Johns River and Tributaries

The TP and TN criteria for this section were based on previous TMDL work, with the TP criterion being approved in a decision dated September 26, 2013, and the TN criterion being approved in decisions dated June 21, 2013, and September 26, 2013. The chl *a* criterion for the Lower St. Johns River and Tributaries (predominantly marine) segment was developed using the reference period approach and was also approved in the September 26, 2013, decision. The entire Section (bb) has now been codified and the TP criterion was revised from the previously approved criterion value.

(bb) Lower St. Johns River and Tributaries (predominantly marine)	For estuary segments with criteria expressed as annual geometric means (AGM), the values shall not be exceeded more than once in a three year period. For criteria expressed as the long-term average of annual means, the long-term average shall be based on data from the most recent seven-year period and shall not be exceeded.		
Lower St. Johns River and Tributaries (predominantly marine)	722,834 kilograms/year	See subsection 62-304.415(2), F.A.C.[21]	5.4 µg/L as long-term average of annual means

EPA Analysis

FDEP has revised the TP criterion codified into rule by this action, as well as codified the TN and chl *a* criteria without revision. A title and introductory language was added at 62-302.532(1)(bb) that defines segment, as well as the duration and frequency for the associated criteria values contained in the table. The EPA's conclusions regarding the addition of the most recent seven year period language in the introductory paragraph is discussed starting on page 13, in the section titled "Consideration of the 'Years of Data' Language Contained in Estuary Introductory Paragraphs." The remaining introductory language is consistent with other entries in this section that have previously been approved by the EPA and determined to be scientifically defensible and protective of the designated use, and are therefore, approved. The codification of the TN and chl *a* criteria is also approved.

The EPA previously approved the TN and chl *a* criteria for all of the reasons stated in the EPA's decision dated September 26, 2013. The EPA had previously approved the same TN criterion as a Hierarchy 1 in a decision dated June 21, 2013. The EPA is acting on and approves the following cross-referenced language: "(2) The Total Maximum Daily Load for the marine segments of the Lower St. Johns River, which is that portion of the river from Black Creek to the mouth, is 1,376,855 kilograms per year (kg/y) of Total Nitrogen (TN)."

[21] "(2) The Total Maximum Daily Load for the marine segments of the Lower St. Johns River, which is that portion of the river from Black Creek to the mouth, is 1,376,855 kilograms per year (kg/y) of Total Nitrogen (TN), . . ."

The scientific basis for the revision to the TP criterion is presented on pages 202-205 of the TSD and was further clarified in the state's supplemental document from February 1, 2017. In its February 1, 2017 clarification document, the state noted that:

> ...[T]he allowable TP load increased significantly between the August 1 Report and the final NNC adopted in 2014 because the department discovered several errors that were made when the Department calculated the existing TP loads to the river for the August 1 Report.
>
> For one, the department inadvertently did not include the TP nonpoint loads from the oligohaline ecozones of the river, which averaged 124,700 kg/year for nonpoint sources (see Table 1 below and Table 4.28a of the TSD). Second, the department used the measured point source loads for the baseline years (observed discharge loadings over the 1995 -1999 period from tables in Appendix D of the TMDL report), and should have instead used the "starting point loads" recommended by the LSJR TMDL Executive Committee, which took into account permitted loads, anticipated growth, and whether facilities provided Advanced Wastewater Treatment (AWT). The starting TP loads for facilities discharging to the marine portion of the Lower St. Johns are provided in Table 4 of TMDL document, and the cumulative annual TP load was 509,694 kg/yr.
>
> Third, the department did not include the allocation for future APRICOT Act (Section 403.086(7), Florida Statutes) discharges. Consistent with EPA TMDL guidance, the Executive Committee recommended providing an allocation for future growth of domestic wastewater facilities in the basin, and concluded that any new facilities should meet stringent APRICOT Act requirements (AWT treatment and high level disinfection, with discharges to surface waters limited to 30% of permitted reuse capacity on an annual basis). The resultant allocation for APRICOT Act discharges to the marine portion was 1,660 kg TP/yr. It should be noted that allocations for future growth are conservative under a TMDL because they result in greater reductions in load for existing facilities (in this case, the required reductions in Total Nitrogen were greater for existing discharges).
>
> The corrected TP loads from point and nonpoint sources are shown in Table 2, which shows the total TP load that was adopted as the TP criterion for the marine portion of the river. It should be emphasized that all of the loads that were missing in the August 1 Report (the oligohaline zone nonpoint source loads, "starting point" point source loads, and APRICOT Act allocation for future growth) were included in the "design model runs" that were used to establish the TMDL. The model indicated that reductions in TP load were not needed as long as the TN load was reduced to the levels required under the TMDL...

Based on the information provided by the state, the revised TP criterion is consistent with the previously EPA-approved NNC and is protective of the designated use, and therefore approved as consistent with the CWA and the EPA's implementing regulations.

(cc) St. Marys River

The St. Marys River NNC were developed using the reference period approach. FDEP revised the NNC based on use of the modified reference approach where conditions met the requirements for its use and an increase in the amount of data available for criteria derivation calculations.

(cc) St. Marys River	For estuary segments with criteria expressed as annual geometric means (AGM), the values shall not be exceeded more than once in a three year period. For all other estuary segments, the criteria shall not be exceeded in more than 10 percent of the measurements and shall be assessed over the most recent seven year period.		
1. Lower St. Marys River	0.181 mg/L	0.77 mg/L as AGM	12.9 µg/L
2. Middle St. Marys River	0.113 mg/L as AGM	1.12 mg/L as AGM	8.0 µg/L
3. Upper St. Marys River	0.093 mg/L as AGM	1.35 mg/L as AGM	3.0 µg/L as AGM

EPA Analysis

FDEP has revised the NNC codified into rule by this action and the EPA is approving all of these revisions. Introductory language was added in St. Marys River that defines the duration and frequency for the associated criteria values contained in the table. The EPA's conclusions regarding the addition of the most recent seven year period language in the introductory paragraph is discussed starting on page 13, in the section titled "Consideration of the 'Years of Data' Language Contained in Estuary Introductory Paragraphs." The remaining introductory language is consistent with other entries in this section that have previously been approved by the EPA and were determined to be scientifically defensible and protective of the designated use, and are therefore, approved.

As a matter of further characterizing watersheds within the St. Marys River, FDEP determined that Lower St. Marys River; Middle St. Marys River; and Upper St. Marys River qualified for the modified reference period approach due to minimal disturbance in the overall watershed. However, the modified reference approach was not used for the chl *a* criterion for the Middle St. Marys segment or the TP and chl *a* criteria for the Lower St. Marys segment. Where the modified reference approach was used, watershed disturbance levels were based on the Land Disturbance Index scores for each watershed. This technical approach sets NNC magnitudes expressed as an AGM at the 90% prediction interval of the AGM concentrations, rather than the 80% prediction interval (discussed in more detail above). The EPA has determined this approach to be scientifically defensible for minimally disturbed watersheds and protective of the designated use and therefore, approves it.

For those segments where the modified reference approach was not used, the state's previous methodology was used. The chl *a* criterion for the Middle St. Marys segment was based on the 90% prediction interval not to be exceeded more than 10% of the time due to the size of the dataset for that parameter. In addition to having two dischargers within the segment and therefore, not qualifying for the modified reference approach, the TP and chl *a* criteria for the Lower St. Marys segment were also based on 90% prediction interval due to the size of the dataset for those parameters. Since these criteria were based methods previously approved by the EPA, the EPA is approving these revisions for the same reasons stated in the September 26, 2013 decision.

Amendment to Subsection 62-302.532(3)

Subsection 62-302.532(3) now reads as follows.

> Estuarine and marine areas for the estuaries listed in subsection 62-302.532(1), F.A.C., are delineated in the maps of the Florida Estuary Nutrient Regions, dated October 2014 (http://www.flrules.org/Gateway/reference.asp?No=Ref-05420). ~~Southwest and South Florida Southwest and South Florida estuaries listed in paragraphs 62-302.532(1)(a)-(j), F.A.C., are delineated in the eight maps of the Florida Marine Nutrient Regions, dated May 13, 2013 (http://www.flrules.org/Gateway/reference.asp?No=Ref-03020), which are incorporated by reference. Estuarine and marine areas for the Panhandle estuaries listed in paragraphs 62-~~

~~302.532(1)(k)-(p), F.A.C., are delineated in the six maps of the Florida Marine Nutrient Regions, dated October 1, 2012 (http://www.flrules.org/Gateway/reference.asp?No=Ref-03021), which are incorporated by reference. Estuarine and marine areas for the estuaries listed in paragraphs 62-302.532(1)(q)-(w), F.A.C., are delineated in the seven maps of the Florida Marine Nutrient Regions, dated May 13, 2013 (http://www.flrules.org/Gateway/reference.asp?No=Ref-03022),~~ which are incorporated by reference herein. Copies of these maps may be obtained by writing to Florida Department of Environmental Protection, Standards and Assessment Section, 2600 Blair Stone Road, MS #6511, Tallahassee, FL 32399-2400.

The rule incorporates by reference maps of each of the named estuarine and marine areas covered by subsection 62-302.532(1). The previously available URL addresses are being removed by this rule amendment. The EPA agrees that it is appropriate to restrict the application of these criteria to the areas of waters used in the derivation of the criteria values. The EPA concludes that updated maps added to subsection 62-302.532(3) along with the criteria contained in 62-302.532(1) provide protection for healthy, well-balanced biological communities in the subject estuarine and marine areas. Therefore, the revisions to subsection 62-302.532(3) are consistent with the CWA, 40 CFR Part 131, and the EPA's guidance on nutrient criteria and are approved by the EPA pursuant to CWA Section 303(c).

Amendment to Subsection 62-302.532(4)

Subsection 62-302.532(4) was deleted as follows.

~~The Department shall establish by rule or final order estuary specific numeric interpretations of the narrative nutrient criteria for TN and TP for Perdido Bay, Pensacola Bay (including Escambia Bay), St. Andrews Bay, Choctawhatchee Bay, and Apalachicola Bay by June 30, 2013, subject to the provisions of Chapter 120, F.S. The Department shall establish by rule or final order the estuary specific numeric interpretation of the narrative nutrient criteria for TN and TP for the remaining estuaries by June 30, 2015, subject to the provisions of Chapter 120, F.S.~~

As noted in the EPA's November 30, 2012, decision this provision established a future commitment by the State to develop protective numeric nutrient criteria. At that time, the EPA concluded the provision did not constitute a change to the current water quality standards, as it only lays out a schedule for actions to be taken by the State. Therefore, the deletion of the language continues to not be considered as a change to water quality standards. With this conclusion, no further action is needed regarding this provision.

EPA Action

The EPA has determined that the provisions in 62-302.532(1)(a)-(cc) establishing new or revised numeric nutrient criteria are based on scientifically defensible technical approaches for the waters covered by these criteria. FDEP has provided support for the criteria in the companion TSD titled "Numeric Nutrient Criteria for Estuaries Addressed dated January 30, 2015," demonstrating that the NNC contained in the 62-302.532(1)(a)-(cc) are based on a scientific rationale that will protect the uses designated by the State for the estuarine and marine waters covered by this rule. Additionally, the revisions to the maps used to delineate the locations of the site specific criteria were determined to continue to protect the uses designated by the State for the applicable waters shown in the maps. The EPA concludes that the criteria provided in 62-302.532(1)(a)-(cc) and depicted in maps at 62-302.532(3) are based on scientifically defensible methods and protect the uses designated by the State in these

estuarine and marine areas and, therefore, are consistent with the CWA, 40 CFR Part 131, and the EPA's 304(a) guidance on nutrient criteria. In accordance with Section 303(c) of the CWA, the new or revised water quality standards addressed in this document are hereby approved as consistent with the CWA and 40 CFR Part 131.

Oct. 19, 2017
Date

Mary S. Walker
Director, Water Protection Division